EPB/50
PH1/3 (ABR4) Vol 7

(204) 47

THE

PHILOSOPHICAL TRANSACTIONS

(From the Year 1719, to the Year 1733)

ABRIDGED,

AND

Disposed under General HEADS.

By Mr JOHN EAMES, *F. R. S.*

AND

JOHN MARTYN, *F. R. S.* Professor of *Botany* in the University of *CAMBRIDGE.*

VOL. VII.

CONTAINING,

PART III. The ANATOMICAL and MEDICAL Papers.

AND

PART IV. The PHILOLOGICAL and MISCELLANEOUS Papers.

LONDON:

Printed for J. BROTHERTON, J. HAZARD, W. MEADOWS, T. COX, W. HINCHLIFFE, W. BICKERTON, T. ASTLEY, S. AUSTEN, L. GILLIVER, and R. WILLOCK. 1734.

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PART III.

CONTAINING THE

Anatomical and *Medical* PAPERS.

CHAP. I.

ZOOLOGY, *and the Anatomy of* ANIMALS.

I. THE Hunter in a clear Sun-ſhiny day, takes a Plate, or Trencher, with a little Sugar, Honey, or Moloſſes, ſpread on it, and when got into the Woods, ſets it down on a Rock or Stump: this the Bees ſoon find out; for 'tis generally ſuppoſed a Bee will ſcent Honey or Wax above a Mile's diſtance. The Hunter ſecures in a Box or other Conveniency, one or more of the Bees as they fill themſelves, and after a little time lets one of them go, obſerving very carefully the Courſe it ſteers; for after it riſes in the Air, it flies directly, or upon a ſtreight Courſe, to the Tree where the Hive is.

A Method lately found out in New-England, *for diſcovering where the Bees hive in the Woods, in order to get their Honey. By the Hon.* Paul Dudley *Eſq; F. R. S.* No. 376. p. 148.

In order to this, the Hunter carries with him his Pocket-Compaſs, his Rule, and other Implements, with a Sheet of Paper, and ſets down the Courſe, ſuppoſe it be Weſt; by this he is ſure the Tree muſt be ſomewhere in a Weſt Line from where he is, but wants to know the exact Diſtance from his Station; in order to determine that, he makes an off-ſet either South or North (we'll ſuppoſe North)

a hundred Perch or Rod, (if it be more, it will ſtill be more exact, becauſe the Angle will not be ſo acute) then he takes out another Bee and lets him go, obſerving his Courſe alſo very carefully, for he being loaded will, as the firſt, (after he is mounted a convenient height) fly directly to the Hive; this ſecond Courſe, (as I muſt call it) the Hunter finds to be South, 54 Degrees Weſt; then there remains nothing but to find out where the two Courſes interſect, or, which is the ſame thing, the Diſtance from *B* to *A*, or from *C* to *A*, as in the Figure, for there the Honey-Tree is. *Fig.* 1.

For which Reaſon, if the Courſe of the ſecond Bee from *C* had been South weſt, and by South, *viz.* to *D*, then the Hive-Tree muſt have been there, for there the Lines are found to interſect.

I cannot diſmiſs this Subject, without acquainting you, that all the Bees we have in our Gardens, or Woods, and which now are in great numbers, are the produce of ſuch as were brought in Hives from *England* near a hundred Years ago, and not the natural produce of this part of *America*; for the firſt Planters of *New England* never obſerved a Bee in the Woods, until many Years after the Country was ſettled; but that which proves it beyond queſtion is, that the *Aborigines* have no word in their Language for a Bee, as they have for all Animals whatſoever proper to, or aboriginally of, the Country, and therefore for many Years called a Bee by the name of *Engliſh-Man's Fly*.

I will mention another thing with reſpect to Bees, tho' I do not know but it may have been commonly obſerved; and that is, when they ſwarm they never go to the Northward, but move Southward, or inclining that way.

I ſhould have taken notice in the proper place, that when one Bee goes home from the Sugar-plate, he returns with a conſiderable number from the Hive.

Obſervations about Waſps, *and the Difference of their Sexes. By the Rev. Mr* Derham, *F. R. S.* N°. 382. p. 53.

II. In the Beginning of *July* 1723, being on the Top of our *Collegiate Chapel* in *Windſor Caſtle*, I obſerved a Cluſter of three *Waſps* cloſely embracing each other; one of which was a large *Female Waſp*, the other two of a leſſer ſort. Soon after, I found eight or ten *Waſps* cloſely hanging together, and divers other ſuch like Parcels. In the midſt of all which was conſtantly a *Queen Waſp*, and only one; the reſt being always of a different Sort from either the Queen or the common Waſps; which gave me a Suſpicion of their being *Male* and *Female*. And therefore examining another Company of them with greater Strictneſs, I found the *Queen Waſp*, *in coitu*, with one of the other Waſps, ſo cloſely joined Tail to Tail, that it was ſome Time before they were parted.

After this I caught all the Waſps I could, on the top of our Chapel, but could not ſee one of the *common labouring Waſps* among them; but all were for the moſt part *Male Waſps*, with now and then a *Queen*, or *Female*, among them, and ſhe generally *in coitu*.

And

Plate I. Vol VII. part III. page 404.

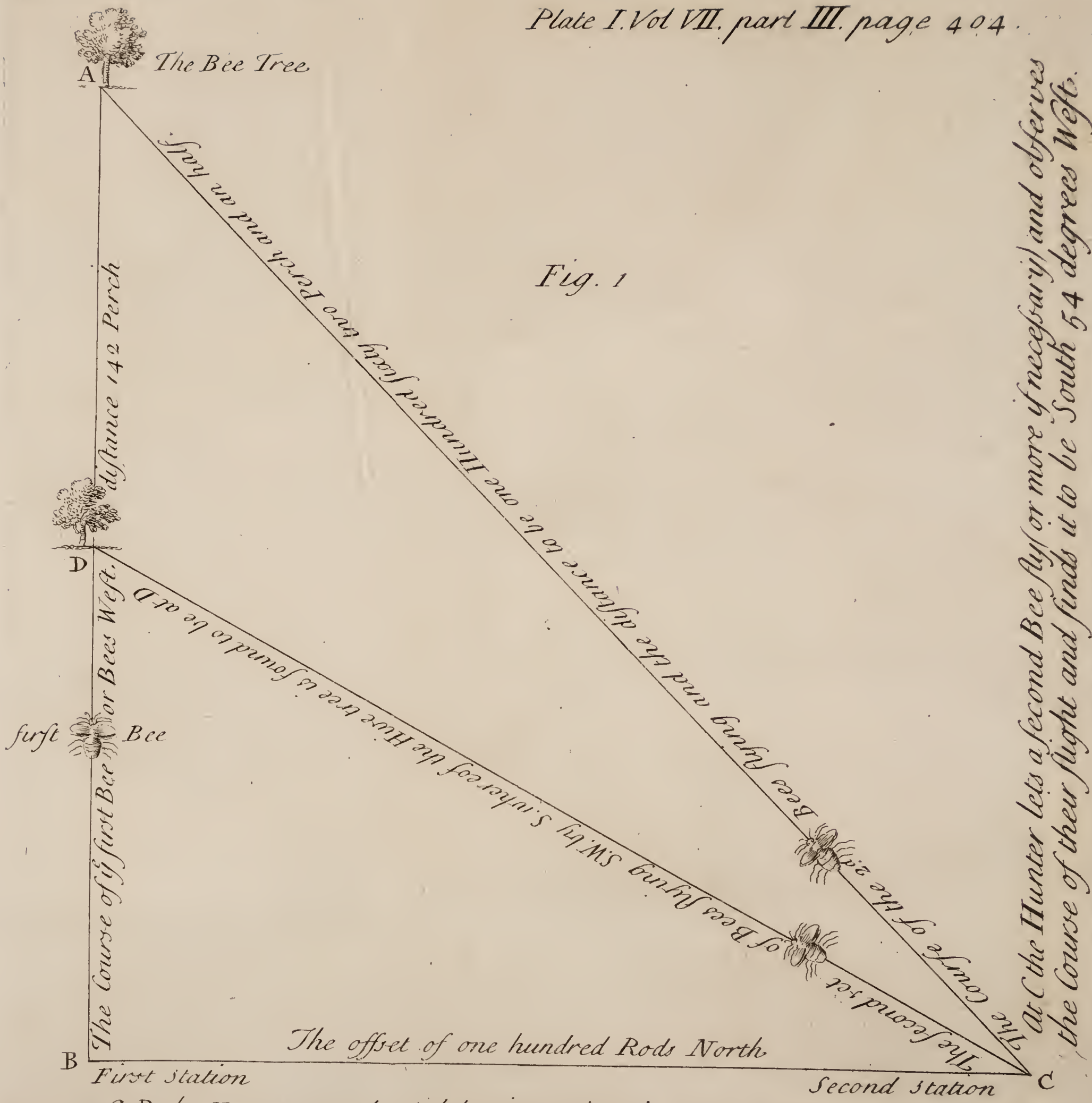


Fig. 1

At B the Hunter stands and having with his sugar &c procured one or more Bees observes the Course of the first Bee & finds it to be due West

N.B. If the Hunter is not satisfied of the Courses of either first or second by the flight of one Bee, he lets more fly until he is very certain.

And now from this Hiſtory of my Obſervation, it appears, That there are three ſorts of *Waſps*; The *Queens*, or *Females*; the *Kings*, or *Males*; and the *common Labouring Waſps*; each of them very diſtinct.

The *Queen*, or *Female Waſp* (by many called the *King-Waſp*) is much longer in the Body, and larger than any other Waſp.

The *Male Waſps* are leſſer than the *Queens*, but as much longer and larger than the *common Waſps*, as the *Queen* is longer and larger than theſe. Theſe *Males* alſo have no Stings, which the *Queens* and *common Waſps* all have. And theſe are thoſe which *Mouſet* ſaith Authors call Ἀκέντρους, and take to be *Females*, although he is of another Opinion, imagining all Waſps to have Stings; upon his examining a Waſp's Neſt, at *Ham*, *Anno* 1587. in which he found no Waſps without a Sting. But I wonder how that curious Enquirer miſſed of theſe ſting-leſs Male *Waſps*. Surely he was too haſty in his Examination, and not being aware of the difference, he thought the *Males* (which are but few in number to the *labouring Waſps*) were the ſame and had Stings as well as the reſt; or elſe he made his Enquiry at a Time when perhaps the Males had deſerted the Neſt, which probably they may do, as the *Male* or *Drone-Bees* are forced to do: or elſe the Year 1587. (in which *Mouſet* made his Obſervation) might produce fewer *Waſps*, at leaſt fewer *Male Waſps*, than this laſt Summer, of 1723, did, in which I made my Obſervation; which was obſerved to have a greater abundance of Waſp Neſts than hath been known in many Years. And in all the Neſts that I ſearched into, I conſtantly found *Male Waſps*, either many or few, according to the Size of the Neſt, and Number of Waſps. And the Part of the Neſt where theſe Males are bred, or at leaſt where I found them moſt to reſide, was chiefly the two uppermoſt Cells, or Partings, between the Combs, but one.

Another thing by which the *Male Waſps*, may be known from the reſt, is their *Antennæ*, or *Horns*; which are longer and larger than either thoſe of the *Queen*, or *common Waſps*; and with them they ſeem, in running, to feel more than the others do.

But the chief Difference, is in the *Parts of Generation* of theſe *Male Waſps*, quite different from other Waſps. I diſſected them with all Care, and ſhall deſcribe them, as well as I can, without Figures, which I could not get drawn.

For the Diſcovery of theſe Parts, if the *Alvus* be preſſed, an *Horny* or *Shell-like Part* will be thruſt out, of a ſhining black Colour, which conſiſts of two Parts, ſomewhat reſembling the *Caſtagnets* uſed in Dancing; at the extreme Part of each of which grows a *Hook*, ſomewhat like thoſe of the Earwig's Tail, but much leſs; in the Middle, between theſe Hooks, appear three Parts, the middlemoſt of which is a ſtiff brown *Tube*, very curiouſly made, with the Fore-part like a Spoon or Ladle, and the other End (within the Body) is

neatly branched and braced to each Side within the two Shells I ſpake of. A little above which Branching, is a φυμάτιον or *Swelling*, like that of a Dog's Pizzle, and perhaps ſerves for the ſame Uſe, if this Tube is (as I imagine) the *Penis* of the Waſp.

On each Side this *Penis*, lies a ſtiff Part (in Number two) branched at the Top with ſomewhat like Hairs, giving them the Reſemblance of *Bruſhes*. At the Bottom of which are two curious black *Cells*, with an *Opening* on one Side like that of the *Concha Veneris*, with ſmall whitiſh Hairs growing on one Edge thereof. What the Uſe of theſe two Bruſh-like Members may be, I know not, unleſs it be to ſtrengthen and ſupport, or direct, the *Penis in coitu*, or provoke therein.

Behind all theſe Parts, more within the Body lies a long contorted white *Veſſel*; which at firſt I took to be the real *Penis*, penetrating the *Ladle-like Tube* I ſpake of. But upon farther Examination, I rather take it to be the *Spermatic Veſſel*.

As to the Uſe of the two little *Hooks* I mentioned at the End of the *Uropygium*, or *Shells*, I take them to be, to catch hold of the *Female*'s *Podex*, and to direct and aſſiſt the Penetration of the *Penis in coitu*.

As for the *Parts of Generation* in the *Queen*, or *Female Waſp*, nothing was to be ſeen ſo remarkable as in the *Male*; but thoſe Parts are very like what we ſee in the *common Labouring Waſps*: Indeed, with the moſt accurate Obſervations I could make with my Microſcopes, I could not perceive any Difference at all. For which Reaſon I ſuppoſe it is that moſt of the Writers upon *Waſps* and *Bees*, have been very confuſed and wavering about the Sexes of theſe two Tribes of Inſects. It would be endleſs to cite the Authors and their Opinions, eſpecially concerning the *Bee Tribe*. I think *Swammerdam* * (who as he was one of the firſt that rejected Equivocal Generation, ſo was one of the moſt judicious Writers of Inſects) that his Opinion, I ſay, is the moſt juſt, *viz.* That of *Bees*, there are three Sorts, *viz.* 1. Rex, *aut veriùs* Regina, *ſiquidem ſequioris ſexûs eſt.* 2. Fuci, *qui Maſculi proprie ſunt.* 3. Apes Operariæ, *quarum Sexum diſtinguere non poſſumus, cùm in iis nec Maſculas nec Fœminas partes obſervemus: quæ perbellè diſtinguuntur in* Fucis *ſeu* Regibus, & Reginis, *quæ tralatitio errore* Reges *ſolent ſalutari. In* Reginis *certè invenimus* Ovarium *apud incomparabilem illum Anatomum* Joh. van Horne, *&c.*

There is a Story ſeriouſly told by *Mouſet* †, that deſerves our Obſervation, *viz.* That *in the Year* 1582, *being on the higheſt Ridges of the* Cartmel-Hills, (I ſuppoſe in *Lancaſhire*) *he ſaw among the Rocks two Species of Waſps deſperately fighting: That they differed only in Magnitude; that the larger truſted to their Strength; and the leſſer to their Numbers, there being ſix of the leſſer engaged againſt only one of the larger*

* Swam. Hiſt. Inſect. p. 92.

† Mouſet Theat. Inſect. l. 1. c. 8.

ſize,

ſize, and that the Battle was not in the Air, but among the Graſs, and laſted for ſome Hours in the hotteſt Sun, not being at an end in two or three Hours ſpace. The Cauſe of this Engagement *Mouſet* thinks was, that the *great Waſps* are wont to rob the *leſſer* of their Honey and Young, or do them ſome other ſuch like Miſchief; and the *leſſer* being very revengful, and naturally full of Courage, did out-brave even *Mars* himſelf in aſſaulting their Enemy. But this Engagement I take to be ſuch another, as that which I have given the Hiſtory of, namely one under the Conduct of *Venus*, not of *Mars*.

And as there is no Doubt to be made of it's being ſuch, and that the Engagement ſeen by *Mouſet* was on the higheſt Tops of *Cartmel* (*in ſummis Cartmeli montium jugis*) as that I ſaw was on the very Top of our *Chapel*, it may deſerve Obſervation, whether the *Waſps* ever copulate in lower Places, obvious to Diſturbance, and every one's Eye, or only on ſuch Eminencies where they can be more out of Sight, and conſequently in greater Safety: And if at any time they ſhould be found in Copulation, they may all with Safety be ſeized with the naked Hand, provided it can be ſecured againſt the *Queen Waſp*, which is the only one in the Company that is provided with a *Sting*.

For a Cloſe of theſe Obſervations about the Sexes of Waſps, I ſhall take Notice of *Mouſet*'s Experiment, (which I tryed) *viz. If you take a Waſp by the Feet, and ſuffer her to buz, that thoſe Waſps, which have no Stings, will fly to her, but not any that have Stings. Which ſome*, he ſaith, *uſe as an Argument to prove that ſome Waſps are Males, ſome Females.* This Experiment I was minded to try with a *Queen Waſp*, more eſpecially, not knowing but that *Waſps*, particularly the *Males*, might be as fond of their *Queens*, as the *Bees* are of theirs, who will not forſake them, but will live and die with them. But I did not find it to ſucceed ſo among the *Waſps*. For although I put ſome *Queen Waſps*, and others alſo, near the Entrance of ſome large *Waſp-Neſts*, yet I did not ſee any Flock near them, only now and then one of the common Waſps, for a little while, to ſee their Fellow confined. But indeed the *Queen Waſps* which I confined were weak, and did not buz long; as alſo the time of Copulation was probably paſt, it being *Auguſt* 12. when I tryed the Experiment.

III. On the Sixteenth of *May*, 1724, I happened to hear, what is commonly called the *Death-Watch*, and, as I caſt a diligent Eye over the ſedge Bottom of a Chair, I happened, to hit luckily upon the Place where the Inſect was beating; ſo that it diſcovered itſelf to me by it's own Pulſations.

An Account of the Scarabæus Galeatus Pulſator, *or* Death Watch. *by Mr* Hugh Stackhouſe. N°. 385. pag. 159.

It lifted up itſelf upon it's hinder Legs, and ſomewhat extending, or rather inclining, it's Neck, beat down it's Face upon the Sedge, with great Force and Agility; the Sedge, upon which I found it, was bared of it's outward Coat, for about the Length of half an Inch; the Inſect ſtood upon the inward bulbous Part, and beat upon the

the outward Coat, as if it had been working it off as it went; the Impreſſions of it's Strokes were very viſible, the Coat of the Sedge being depreſſed, where it had beaten, for about the Compaſs of a ſilver Penny; whether it beat for Exerciſe, or Food, I cannot certainly ſay; but very probably it might be for the latter; and I am rather inclined to think ſo, becauſe there were more than one ſuch Places upon the Sedge, where it had been at work, and where, 'tis likely, it might have been a Sojourner for ſome Days.

As to what Mr *Derham* has obſerved, that the Beatings are a ſort of Prelude for Copulation, I could not diſcover that this Beetle had any other of the ſame Species near it; and therefore I am inclined to think, that it beat for the Preparation of it's Food, at this time, at leaſt, whatſoever it might do at other times, for Pleaſure. The Deſcription Mr *Allen* gives of the Inſect, as far as I can find by this (which I took from the Chair where I found it, into a Box) is very true: 'Tis about a Quarter of an Inch in length, of a dark, dirty Colour, having a broad *Galea*, or Helmet, over it's Head; under which, when quiet, it draws up it's Head; ſo that this *Galea* is, when this Inſect reſts, a very notable Defence againſt ſuch Falls, as are frequent in rotten and decayed Places, in which, this Inſect ſeems to be very converſant. The ſecond Day after I took it, I opened the Box wherein it was, and ſet it in the Sun: The Inſect was ſoon very briſk, and crept backwards and forwards along the Pieces of Sedge, and rotten Wood, that I had put with it into the Box, till at length, getting to the End of one of the Pieces, it immediately ſtruck out it's Wings, and was juſt going to take it's Farewel; but having the Lid of the Box ready in my Hand, I ſhaded it over, and it ſoon drew in it's Wings, and was very quiet. I could not before perceive, though I had the Uſe of a tolerable good Glaſs, any the leaſt Sign of a Fiſſure upon it's Back; and, for that Reaſon, did greatly queſtion, whether it had any Wings or not, till I ſet it, in the Sun. The Head of the Inſect appears to be of a very fine Contexture, as it is ſeen, when it creeps about, and ſtretcheth it forward; but when 'tis drawn up under it's *Galea*, it ſeems to be covered with a Membrane thick ſet with fine Hairs.

It lived with me about a Fortnight, but I could never perceive that it beat, after it was confined in the Box.

A remarkable Accident relating to the Venom of Spiders, in New-England, *by Mr* Thomas Robie, No. 382. p. 69.

IV. *Sept.* 13. 1722, one *Nat. Ware* of *Needham* was bit by a ſmall Spider which he could not give an exact Deſcription of, cruſhing it to Pieces between his Stocking and Leg; the Account he gave is this; *viz.* That getting up early in the Morning, and putting on his Stocking he preſently felt ſomething bite his left Leg a little above his Ancle, about ½ an Hour after he felt a Pain in that Leg, and about ½ an Hour from his firſt perceiving Pain in his Leg, he felt a Pain in his Groin, and at the ſame time Time a creeping Pain in the Calf of his left Leg; and about one Hour after it got into the Small

Small of his Back, and then round him, and in his Stomach, and in his right Thigh, and afterwards Numbneſs in his Head; the Pains were not conſtant and fixed, but erratic and very acute. His Pulſe was very low and heavy. He came to *Cambridge* to a Phyſician there, and I was alſo deſired to go and ſee him, which I did, and he gave me this Account.

Sept. 14. In the Morning the Man aboveſaid came to ſee me, and was much better tho' he had but little Sleep in the Night. The Means the Doctor uſed were only *Sp. Cor. Cerv. & Sal Vol. Corn. Cerv.* with *Vinum Viperin.* and Onions or Garlic externally applied to the Wound. Theſe things raiſed his Pulſe, and ſo, I ſuppoſe, aſſiſted Nature to throw off the Venom.

V. At *Milan* I found a Viper-Catcher, who ſeldom was without Sixty, or more, Vipers alive, kept together in a back Room open at the Top; he had them from all Parts of *Italy*, and ſold them dead or alive, according to the Uſes they were deſigned for. He having got one day a female Viper big with young, gave me notice to ſee her manage her Prey; whereupon we catched ſome Mice, and throwing them in one at a Time, amongſt all that Number of Vipers, (which were rather above Sixty) there was none of them, that in the leaſt concerned himſelf about the Mouſe, till the pregnant female Viper and the Mouſe interchanged Eyes; whereupon the Mouſe ſtartled, but the Viper raiſed her Head, and turned her Neck into a perfect Bow, the Mouth open, the Tongue playing, the Eyes all on Fire, and the Tail erect. The Mouſe ſeemed ſoon recovered of his Fright, would take a Turn or two, and ſometimes more, pretty briſkly, round the Viper, and giving now and then a Squeak, would run with a great deal of Swiftneſs into the Chops of the Viper, where it gradually ſunk down the Gullet. All this while the Viper never ſtirred out of it's Place, but lay in a Ring.

Some Obſervations upon Vipers; by C. J. Sprengell, *M. D. F. R. S.* No. 376. p. 296.

It is to be obſerved, that no Viper will feed, when confined, except a female Viper impregnated.

The ſame I ſaw at *Bruſſels*, where a Soldier had catched a large Viper big with young. The Houſe, where I and ſome of my Companions lodged, was near the Fiſh-Market, where my Landlord had a Sow, and five ſmall Pigs of nine or ten Day old. We cauſed one of the Pigs, to be bit by the Viper in the Tail, and in four Minutes time chopped off the Tail, the Pig appearing to be ſick and dizzy, and the remaining part of the Tail being ſwelled; but I believe the bleeding ſaved it, for the next Morning it was well again. The ſame happened to another Pig, which we had got bit in the fore Foot, and ſtaying ſeven Minutes after the Bite, cut off his Leg about two Inches above the Bite. After theſe two, we took the other three, and had them bit in ſeveral Places, whereof two died that Night, and the third recovered, we having given it, about five or ſix Minutes afterwards, ten Grains of Emetic Tartar.

This I tried afterwards upon Dogs bit by Vipers, and I found that they all recovered upon the Emetic Tartar.

An Account of the Rattleſnake, By the Hon. Paul Dudley, *Eſq*; *F. R. S.* N°. 376. p. 292.

VI. 1. The Rattleſnake is reckoned by the *Ab-origines*, to be the moſt terrible of all Snakes, and the Maſter of the Serpent-kind; that which cauſes their Terror, without doubt, is their mortal Venom, and the Enſign of it is their Rattle; and it is moſt certain, that both Men and Beaſts are more afraid of them, than of other Snakes; and while the common Snake avoids a Man, this will never turn out of the Way.

There are three Sorts, diſtinguiſhed by their Colour, *viz.* a yellowiſh Green, a deep Aſh Colour, and a black Sattin.

The Eye of this Creature has ſomething ſo ſingular and terrible, that there is no looking ſtedfaſtly on him; one is apt, almoſt, to think they are poſſeſſed by ſome Demon.

A Rattleſnake creeps with his Head cloſe to the Ground, and is very ſlow in moving, ſo that a Man may eaſily get out of his Way: His leaping and jumping to do Miſchief, is no more than extending, or uncoiling himſelf; for they don't remove their whole Body, as other Creatures do, when they leap; ſo that a Man is in no Danger of them, if his Diſtance be more than their Length; neither can they do any Harm when they are in their ordinary Motion, until they firſt coil and then extend, or uncoil themſelves, but they both are done in a Moment's Time.

When a Rattleſnake reſts, or ſleeps, he is coiled, and they are obſerved to be exceeding ſleepy.

Our People at firſt took the Noiſe this Creature makes, to be owing to ſome little Bones, or hard looſe Kernels lodged in their Tails; but ſoon diſcovered their Miſtake, and found the Tail to be compoſed of Joints, that lap over one another, ſomewhat like a Lobſter's Tail; and the ſtriking them one upon another, forms that Noiſe, which is ſo terrible to Man and Beaſt. The fierceſt Noiſe is obſerved to be in clear fair Weather, for when 'tis rainy, they make none at all; for which Reaſon, the *Indians* do not care to travel in the Woods, in a Time of Rain, for fear of being among theſe Snakes before they are aware. One other Circumſtance of their rattling has been obſerved, to wit, that if a ſingle Snake be ſurprized and rattles, and there happen to be others near him, they all take the Alarm, and rattle in like manner.

I dare not anſwer for the Truth of every Story I have heard, of their charming, or Power of Faſcination; but yet I am abundantly ſatisfied from many Witneſſes, both *Engliſh* and *Indian*, that a Rattleſnake will charm both Squirrels and Birds from a Tree into his Mouth. A Man of undoubted Probity ſome time ſince told me, that as he was in the Woods, he obſerved a Squirrel in great Diſtreſs, dancing from one Bough to another, and making a lamentable Noiſe, till at laſt he came down the Tree, and ran behind a Log: The Perſon going

going to ſee what was become of him, ſpied a great Snake, that had ſwallowed him.

And I am the rather confirmed in this Relation, becauſe my own Brother, being in the Woods, opened one of theſe Snakes, and found two ſtriped Squirrels in his Belly, and both of them Head foremoſt. When they charm, they make a hoarſe Noiſe with their Mouths, and a ſoft Rattle with their Tails, the Eye at the ſame time fixed on the Prey.

Their general Food conſiſts of Toads, Frogs, Crickets, Graſshoppers, and other Inſects, but principally of Ground Mice; and the Rattleſnake again ſerves for Food to Bears, and even our Hogs will eat them without Harm.

They are viviparous, and bring forth generally about twelve, and in the Month of *June*. A Friend of mine, in the Country, being deſirous to diſcover the Nature and Manner of the Generation of the Rattleſnake, gave me the following Account, *viz.* About the middle of *May*, the Time when the Rattleſnakes firſt come abroad, he took and opened one of them, and in the *Matrix* found twelve ſmall Globes, as big as a common Marble, in Colour like the Yolk of an Egg; in three or four Days more, he took and opened another, and then plainly perceived a white Speck in the Centre of the yellow Globe; in three or four Days more, he diſſected a third, and diſcovered the Head of a Snake; and in a few Days after that, three Quarters of a Snake was formed, and lying round in a Coil. In the latter End of *June*, he killed an old one, and took out perfect live Snakes of ſix Inches long. In *September*, when the old ones take their Young in, and carry them to their Dens, they are not quite a Foot long. They couple in *Auguſt*, and are then moſt dangerous.

I cannot ſay, what other Serpents, or poiſonous Creatures, may do, but I am ſatisfied the Rattleſnake does not traject his Poiſon; and that unleſs the Skin be firſt broke, or an Inciſion made with his Teeth, his Venom can do no Harm; for my Friend aſſured me, that he had made an Experiment of it in this manner: He took the Breech of his Gun, and ſet it upon four or five of them. and after they had bit it, and left ſeveral Drops of their Poiſon, he with his Hand wiped it off without any Harm.

Our People have ſeveral Remedies for the Sting of a Rattleſnake; among others, that which is much made uſe of, is a Root they call Blood-root, I ſuppoſe ſo named, from the Colour of the Root, and the Juice, which is red like Blood. It grows in great Abundance in our Woods; they bruiſe the Root, and bind it above the Place that is bit, to prevent the Poiſon's going farther, at the ſame Time ſcarifying the Place affected; ſome of the Root is alſo boiled, and the Perſon poiſoned drinks the Water.

They are generally from three to five Feet long, and do not commonly exceed twenty Rattles; and yet I have it atteſted, by a Man

of Credit, that he killed a Rattleſnake, ſome Years ſince, that had between ſeventy and eighty Rattles, with a ſprinkling of grey Hairs, like Briſtles, over his Body; he was full five Foot and a half long, and as big as the Calf of a Man's Leg.

They ſhed, or throw off, their Skins every Year, ſome time in the Month of *June*, and turn it inſide out when they throw it off. It has alſo been obſerved, that the Skin covers not only the Body, but the Head and Eyes.

They generally den among the Rocks in great Numbers together, the Time of their retiring is about the middle of *September*, and they do not come abroad till the middle of *May*, when our Hunters watch them, as they come out a ſunning, and kill them by hundreds.

Experiments on the Effects of the Poiſon of the Rattleſnake. By Capt. Hall. N°. 399. p. 309.

2. In *South Carolina*, on the tenth of *May*, *Anno* 1720, having got a fine healthful Rattleſnake about four feet long, I perſuaded three or four Gentlemen, and one Mr *Kidwell* a Surgeon, to aſſiſt me in making ſome Experiments on the Effects of it's Poiſon.

We got three Curr-Dogs, the biggeſt not larger than a common Harrier, and the leaſt about the bigneſs of the largeſt ſized Lap-Dog, all of them ſmooth-haired

The Snake being tyed and pinned down to a Graſs-plat, we took the largeſt of them, which was a white one, and having tyed a Cord round his Neck, ſo that it ſhould not ſtrangle him, another Perſon held one end while I held the other; the length was not more than four Yards each way from the Dog.

Immediately on our bringing the Dog over the Snake, the Snake raiſed himſelf near two feet, and bit the Dog as he was jumping; the Dog yelped, by which I perceived he was bitten; and upon it I pulled him to me, as faſt as I could, and perceived his Eyes fixt, his Tongue between his Teeth, which were cloſed, his Lips ſo drawn up as to leave his Teeth and Gums bare: In ſhort, he was quite dead in a quarter of a Minute; but one Perſon (beſide myſelf) was of Opinion it was in half that time: The firſt was the Opinion of the By-ſtanders, who were five or ſix; but I believe, none of them ſo much uſed to meaſure time as the Gentleman and I were, from our conſtant making uſe of the half Minute, and quarter Minute Glaſs at Sea. We could not ſee where the Dog was bitten, nor any Blood: Upon which we ordered ſome hot Water to ſcald the Hair off; when we could find but one Puncture, which looked of a bluiſh Green a little round it; it was juſt between his fore Leg, and his Breaſt; where (when the Legs are diſtended) the Hair is much thinner than in ſome other places.

Half an Hour after the firſt Bite we took a ſecond Dog, which was ſomewhat leſs, of a Liver-Colour, and in like manner brought him over the Snake, which in a very little time bit his Ear, ſo that we all ſaw it; he yelped very much, and ſoon ſhewed the ſigns of being very ſick, holding that Ear that was bit uppermoſt. He reeled and

ſtaggered about for ſome time; then he fell down, and ſtruggled as if convulſed, and for two or three times got up, each time wagging his Tail, tho' ſlowly, and attempting to follow a Negro-Boy, who uſed to make much of him. We put him into a Cloſet, and ordered the Boy to look after him.

About an Hour after the ſecond was bitten, we took the third Dog in like manner: The Snake bit him on the right ſide of the Belly, about two Inches behind the long Ribs; for we ſaw he had drawn Blood there. The Dog for about a Minute, ſeemed not to be hurt; ſo we let him go, being one we could get again when we pleaſed. For that Day we put up the Snake, imagining his Poiſon was very near, if not quite, expended.

Two Hours after the ſecond Dog was bit, the Boy told us he was dead.

About an Hour after I perſuaded Mr *Kidwell* to open him, and I was in no ſmall Haſte to examine the Heart, where I perſuaded my ſelf, I ſhould diſcover ſomething extraordinary; but could not perceive any remarkable Difference between that and many others I had ſeen, where there was no Poiſon in the Caſe. Mr *Kidwell* laid open the Skull, and was of Opinion, that the Brain was more red and and ſwoln than any he had ever ſeen; and he told me a little while after, that the Blood turned very black.

For that Day we heard no more of the third Dog which was bitten; but the next Morning the Woman who owned him came to me, complaining of my Cruelty for killing her Dog. She did not know when he died, but ſaid ſhe ſaw him at ſeven that Evening, which was about three hours after he was bit; and that he was ſo ſick he could ſcarce wag his Tail. None of theſe Dogs were ſwoln before they died.

On the Fourteenth, we got two Dogs both as big as common Bull Dogs. The firſt Dog, which he bit on the Inſide of his left Thigh, died in half a minute exactly, in the Opinion of two Gentlemen, who kept their Watches in their hands all the while: There were two very ſmall Punctures in his Thigh, which looked livid, tho' no Blood was drawn. This Dog did not ſwell for four Hours after he was dead.

The ſecond Dog was bit about an Hour after the firſt, on the out ſide of his Thigh, where we perceived the Blood at two places: He ſoon ſickened, and died in four Minutes.

We thought his Poiſon was not ſpent; ſo we got a Cat (for we could get no more Dogs) which he bit about an Hour after, though I cannot ſay where. The Cat was very ſick, and we put her up in a Cloſet: By ſome means the Cat was let out in leſs than an Hour and a half after ſhe was bitten. The next Morning early ſhe was found dead in the Garden, and much ſwoln; ſo that no body cared to examine or ſearch where ſhe was bit.

About a quarter of an Hour after he had bitten the Cat, he bit a Hen twice: The Hen ſeemed very ſick and drooping, and could not, or did not fly up to her uſual place of Rooſt among the reſt that Night; but the next Day ſhe ſeemed very well, and continued ſo till Evening, when I ordered her to be killed, and her Feathers ſcalded off: There were two Punctures in her Thigh, and a Scratch on her Breaſt over the Craw, all which looked livid.

About a Week after, having got a large Bull Frog, we brought that over him as uſual: He bit it with much force; ſo that he ſeemed to faſten for a ſmall ſpace. The Frog died in two minutes or thereabouts. In leſs than an quarter of an Hour he bit a Chicken, which was hatched the *February* before, that died in three minutes; I can not ſay where it was bit, and I was at a loſs to try any further Experiments for a long time, for want of proper Subjects. Dogs and Cats were not to be had; for the good Women, whoſe Dogs had been killed, exclaimed ſo much, that I durſt not meddle with one afterwards.

About the Middle of *June* I took him out according to Cuſtom, and having got a common black Snake, not of the Viper-kind, about two and a half or near three Feet long, in good Health, juſt taken; I put them both together, and irritated them both, that they bit each other, and I perceived the black Snake had drawn Blood of the Rattleſnake before I took them aſunder.

In leſs than eight Minutes the black Snake was dead, and I could not perceive the Rattleſnake at all the worſe or ſick.

On the laſt Day of *June*, I took him out to try, whether if he bit himſelf, it would not prove mortal to him. I hanged him ſo, that he was not above half his Length on the Ground; and with two Needles at the End of a Stick, one to prick, the other to ſcratch, irritated him ſo much that he ſoon bit himſelf, after having attempted to bite the Stick many times. I then let him down, and he was quite dead in eight minutes or thereabouts, but am ſure it did not exceed twelve Minutes.

A Gentleman perſuaded me to cut the Snake in five Pieces which he gave to a Hog, the Head-part firſt, in Sight of many of us. The Hog eat up all the Snake, and ten or twelve Days afterwards I ſaw the ſame Hog alive and in Health.

This was no more than I had ſeen before; but doubted they had taken ſome other Snake for a Rattleſnake: For being at the Houſe of *Charles Hart* Eſq; they ſhewed me a Snake, which a Negro told me he had killed juſt before; it was in three pieces, the Head of it bruiſed into the Ground. While I was looking on, a Sow came and eat it up very greedily, the Negro-man endeavoured to hinder her, being afraid it would kill her; for ſhe had Pigs following her.

I never

I never heard ſhe was ſick for it, tho' I inquired; and about ten Days after I ſaw her in very good Health. I have heard fifty Relations of the ſame kind, and am told that thoſe Hogs which feed in the Marſhes will run after the common ſort of Waterſnakes, which are not poiſonous, and will feed on them greedily: And, in *Maryland*, laſt *Auguſt* was two years, I ſaw a Hog eat up the Head of a Rattleſnake juſt cut off, and while it was gaſping very dreadfully; and I was told, it was a common thing, and it would do them no harm.

On the tenth of *June* 1723, Mr *Thomas Cooper*, a Gentleman who practiſes Phyſic at *Charles Town*, ſent to me to let me know, he had got a fine Rattleſnake which had been taken not above four Days, was about three feet and a half long, and that he deſigned to try whether he could ſave ſome of the Dogs after the Snake ſhould bite them. He provided a large quantity of *Venice-Treacle* or *Mithridate*, I can't poſitively ſay whether, which he divided into two Potions, each about two Ounces; to one of them he put a large quantity of *Diaphoretic Antimony*.

The firſt Dog which the Snake bit on the Inſide of the Thigh, died ſo ſoon (*viz.*) in about half a minute, that we could not get the Potion, which was that *without Antimony*, down his Throat ſoon enough to expect it could have Effect.

Above an Hour after, the ſecond Dog was bitten by him, and had two Punctures or Holes in the fleſhy part of the Inſide of his left fore Leg, which did bleed more than any I had ſeen before: We immediately got down his Throat that Preparation *with Antimony*. He ſoon grew very ſick and ſtrove to vomit; but I think brought up very little, if any; he frothed at the Mouth, and bit at the Graſs, which he champed, as if he were mad; and indeed we were all afraid of him. We therefore put him into a Room and there kept him till next Morning, where I ſaw him as I thought recovered: We throwed him ſome Meat, which he eat, ſo we let him out and he went home. About a Month after that, the Dog's Hair came off, and his Maſter killed him, being ſo ugly to look at; for he told me, he looked like a Leprous Perſon (that was his very Expreſſion). I never heard that this Dog ſwelled.

The third Dog which he bit was a Shaggy Spaniel, about an hour and a quarter after the ſecond. He was bitten on the foremoſt part of his right Shoulder, as we perceived by the Blood. The Dog ſeemed to bite at the place himſelf, and was very ſick for about two or three hours; but, without any means or application, he recovered and I never heard he was ſick afterwards.

3. This

The Anatomy of the Poiſonous Apparatus of a Rattleſnake, with an Account of the quick Effects of it's Poiſon; by John Ranby, *Eſq; F. R. S.* No. 401. p. 377.

3. This Animal was ſent from *Virginia*, and placed in my Hands, on purpoſe to make ſuch Experiments with it as might inform Mankind of the Symptoms which attend it's Bite, and the Appearances in the dead Bodies of ſuch Animals as have been bit by it. It is only by this Method, and a Number of Facts faithfully ſtated and compared with each other, that we may hope one Time or other to diſcover the Manner of the Poiſon's operating, and perhaps to find out ſome Remedies, internal or external, to relieve Perſons bit by it. The Anatomy of the Rattleſnake having been ſo accurately deſcribed by the late ingenious Dr *Tyſon*, very little more can be added to his Account; I ſhall therefore only take Notice of the *Inſtruments* of it's Poiſon, ſome of which are different from what that celebrated Anatomiſt obſerved. Removing then the common Integuments of the Head, the *Muſcles* that raiſe the poiſonous Fangs appear; the firſt of which ariſes with a ſhort fleſhy Beginning from the upper Edge of the lower Jaw, near the Articulation of one of thoſe Bones which Dr *Tyſon* calls *Maxillarum Dilatores Fig.* 2. A. and ſends a few carnous Fibres to the Side of the *Cranium*; then becomes tendinous, and ſo marches to it's Inſertion in the Outſide of the Bone which receives the poiſonous Fang, *Fig.* 3. Diſplacing this Muſcle there appeared a *Gland*, *Fig.* 2. B. about the Bigneſs of a ſmall Pea, which I take to be one of the *Maxillary* Glands, for the following Reaſons: *Firſt*, The Structure of the Parts, and it's Diſtance from the Fang, make it unlikely to be deſigned for ſeparating the poiſonous Fluid, but rather a *Saliva* to moiſten the Aliment, in order to make it paſs down the *Oeſophagus* with Eaſe, the Stomach of thoſe Animals being but ſmall, and the Gullet conſiderably larger; not without ſome Analogy to the *Ingluvies*, or Crop, of granivorous Fowls, where the Food ſtops for ſome time and is moiſtened, before it is capable of deſcending into the Stomach. *Secondly*, Theſe Parts are ſo contrived, that on opening the Mouth to receive the Prey (at which Time ſuch a Fluid is moſt wanted) the Muſcle, above mentioned, preſſing on the Gland promotes the Diſcharge of it's Contents into the Mouth. The *Duct* of this Gland ſeems to open between the Upper Lip and the Jaw, but as the excretory Ducts of ſo ſmall a Gland are rarely to be ſeen with Certainty, I will not pretend exactly to determine it's Aperture. Under this Gland lies another Muſcle ſmaller than the former, which ariſes and is inſerted near it *Fig.* 2. C. theſe two Muſcles draw the Bone *Fig.* 2. D. in which the poiſonous Fang is fixed a little outwards and upwards. Between the laſt deſcribed Muſcle and Gland paſſes a *Nerve* to the upper Part of the Bone which receives the Tooth *Fig.* 2. E. and *Fig.* 3. B. and it is probable that this *Nerve* has been taken for the excretory Duct of the Gland before mentioned. Opening the Mouth, two ſmall *Eminencies* appear in the Fore-part on the Inſide of the upper Jaw, being a *Membrane*, raiſed by the Fangs and drawn over them like the Mouth of a Purſe *Fig.* 4. A. B. *Fig.* 3. C. This

Fig. 2. *Fig.* 3. *Fig.* 4.

Membrane

Membrane is thick and ſtrong, and, placed in a Microſcope, appears to have a Number of Glands, ſome of which are even viſible to the naked Eye. In a common Viper I obſerved one on each Side the Fang. Theſe Membranes prevent the involuntary Diſcharge of the Poiſon out of the Fangs (which, in my Opinion, are the only Repoſitories of that Fluid) into the Mouth, as alſo the killing with the Fangs little Animals on which they ſometimes feed. Putting back this Membrane, the fatal Fangs appear, which on firſt View ſeemed to be only one on each Side, till ſearching further there appeared four more; the firſt and largeſt is fixed in a Bone, which is articulated to the fore Part of the upper Jaw *Fig.* 2. F. The four others are faſtened in and covered with ſtrong tendinous Membranes, and lie as it were one over another *Fig.* 3. B. *Fig.* 4. C. and E. Theſe Teeth are crooked and bent as in *Fig.* 6. eſpecially the firſt, and have each two Perfo- *Fig.* 6. rations, the one on the upper Part, the other the lower Part of it's convex Side; which laſt comes quite to the Point, and reſembles the ſloping Cut of a Pen. The upper Perforation *Fig.* 5. A. I imagine receives the Poiſon, the other tranſmits it into the Wound *Fig.* 5. B. All theſe Fangs are tubular, the largeſt of which contained a ſmall Quantity of a tranſparent Fluid of a light yellowiſh Colour, which, on putting the Snake into Spirit of Wine, changed to a beautiful Red (the Fangs of the common Vipers I have examined had the lower Perforation nearer the middle). Freeing the Mouth of the Membrane, a Muſcle appears about the Size of the firſt deſcribed above, which ariſes from the Middle of the *Maxillarum Dilatores Fig.* 4. D. D. and is inſerted on the under Side of the largeſt Tooth, for the Force required to pull down the Fang being leſs than to raiſe it, fewer Muſcles are required. This Animal was in my Cuſtody about a Month, during which Time he bit three Dogs, and a Cat; the two firſt were bit at the *College of Phyſicians*, and of theſe the firſt died about two Minutes after the Bite, and the Moment he was bit he grew convulſed, and loſt the Uſe of his Limbs. The Wounds were exceedingly ſmall, and between the pectoral Muſcles. Upon opening the Dog, the Skin and *Membrana adipoſa* for the Breadth of a Crown were livid about the Wound, as if from a violent Blow. The ſecond Dog had the ſame Symptoms with the firſt, but lived near a Quarter of an Hour, and had bloody Stools. Three Days after, I carried the Snake to bite another Dog and Cat. The Dog was larger than either of the two former, and having been bit at the Extremity of the Noſe he was immediately affected, howled, ſhook, fell down and foamed at the Mouth; and in about ten Minutes diſcharged his Excrements involuntarily, tinged with Blood: He died in about two Hours. The next Day I opened the Body and obſerved the *abdominal* Contents very much inflamed, eſpecially the Stomach and Inteſtines, which appeared nearly equal to the fineſt Injection; opening the Stomach and Inteſtines they contained a mucous Matter,

Matter, the greateſt Part of which was Blood, and the fine villous Coat which is ſo viſible in theſe Animals was entirely deſtroyed. About an Hour before he was bit he had a plentiful Meal of coarſe Beef, of which there was not the leaſt Appearance. Opening the *Thorax*, the *Pleura* and other Membranes looked as if injected; the Heart was turgid with Blood, as were alſo it's Veſſels. The Veſſels of the Membranes of the Brain made a moſt beautiful Figure from the Quantity of Blood contained in them, as did likewiſe the Blood-Veſſels of the Nerves; there was a ſmall Quantity of Water between the two Hemiſpheres. The Blood contained in the Heart, and it's Veſſels, was an even Maſs about the Conſiſtence of Cream. The Cat had upon opening nearly the ſame Appearances, and lived about five Hours.

The Hirudinella Marina, or *Sea-Leach*, *by Monſ.* Garcin. *Tranſlated from the* French, *by* John Martyn, *F. R. S.* N°. 415. p. 387.

VII. I found this Worm in the empty Stomach of a Fiſh, called by the *Portugeze*, *Bonite:* It was faſtened, by it's Protuberance, upon one of the Folds of the inner Membrane. It made a pretty deal of Reſiſtance when I endeavoured to pluck it away.

Fig. 7.

It's Shape, came very near that of a *Leach*; it had all the Motions of that Animal, together with ſome of it's own. *Fig.* 7. repreſents this Inſect in it's natural Bigneſs, and according to it's moſt conſtant Dimenſions; it's Body is round throughout it's whole Length almoſt, but a little flatted towards it's Belly B; ſo that it's Circumference, taken according to it's Thickneſs, is almoſt elliptic. It is adorned all along with little circular Furrows parallel to each other, and very cloſe together, but ſo fine, that one can ſcarce perceive them without a Microſcope. It is of a greyiſh Colour, and it's Body is a little tranſparent. On it's Back, as well as underneath, two black Lines begin by an acute Angle towards the Neck, and running through the whole Length of the Body, ſeem to be terminated towards the *Anus*. Theſe Lines are Tubes, or Bowels, which ſerve for Nutrition, or Chylification, which appear through the Integuments. I ſhall divide the Length of this little *Leach* into two Parts, diſtinguiſhed by the Center of a little Protuberance C, which is under it's Belly, and is a muſcular Body, in Form of a ſpherical Bladder. Theſe two Parts of the Body are in the Proportion of four to three. I ſhall call them the fore Part and the hind Part. This little Protuberance, in it's greateſt Extenſion may be compared to the Cup of an Acorn, with the Mouth a little contracted. The Head, E, which makes the ſmalleſt End of this Worm, has a hollow Body underneath, of a conical, or almoſt hemiſpherical, Figure, which ſeems to ſerve it for a Mouth to ſuck, as well as to faſten itſelf on the various Bodies which come in it's Way, after the manner of the other *Leaches*.

The Belly, B, is of a dark Colour, becauſe ſeveral Bowels, which are contained in it, are filled with a thick, black Liquor, which makes it look as if the Skin was of that Colour. The fore Part, CE, is variouſly ſhaped, according to it's different Motions; ſometimes it

Fig. 2.

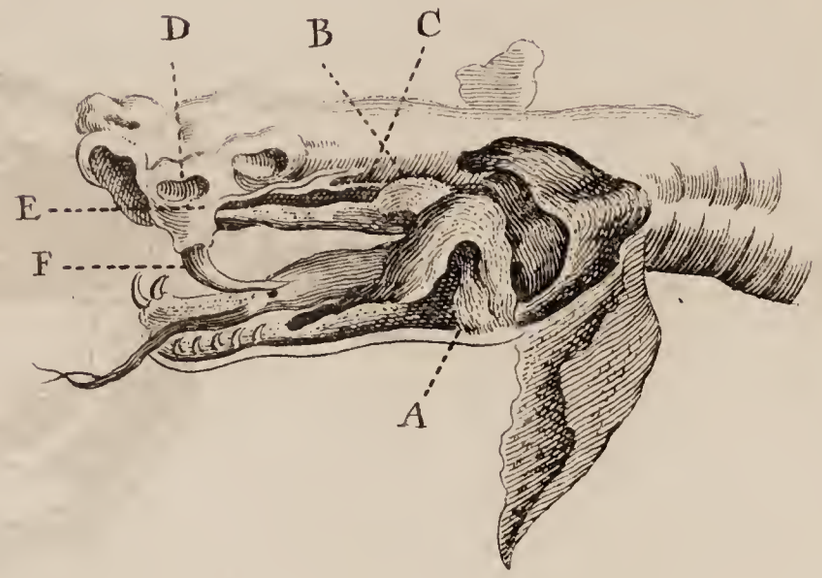


Fig. 3.

Fig. 4.

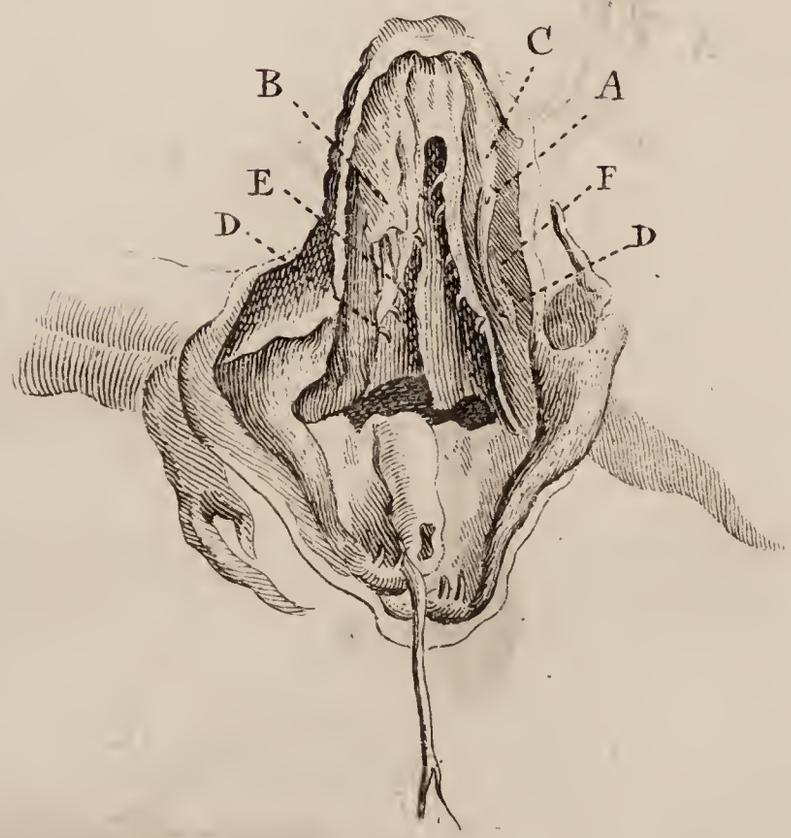


Fig. 5.

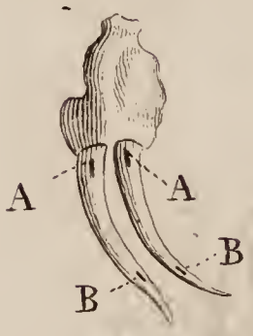
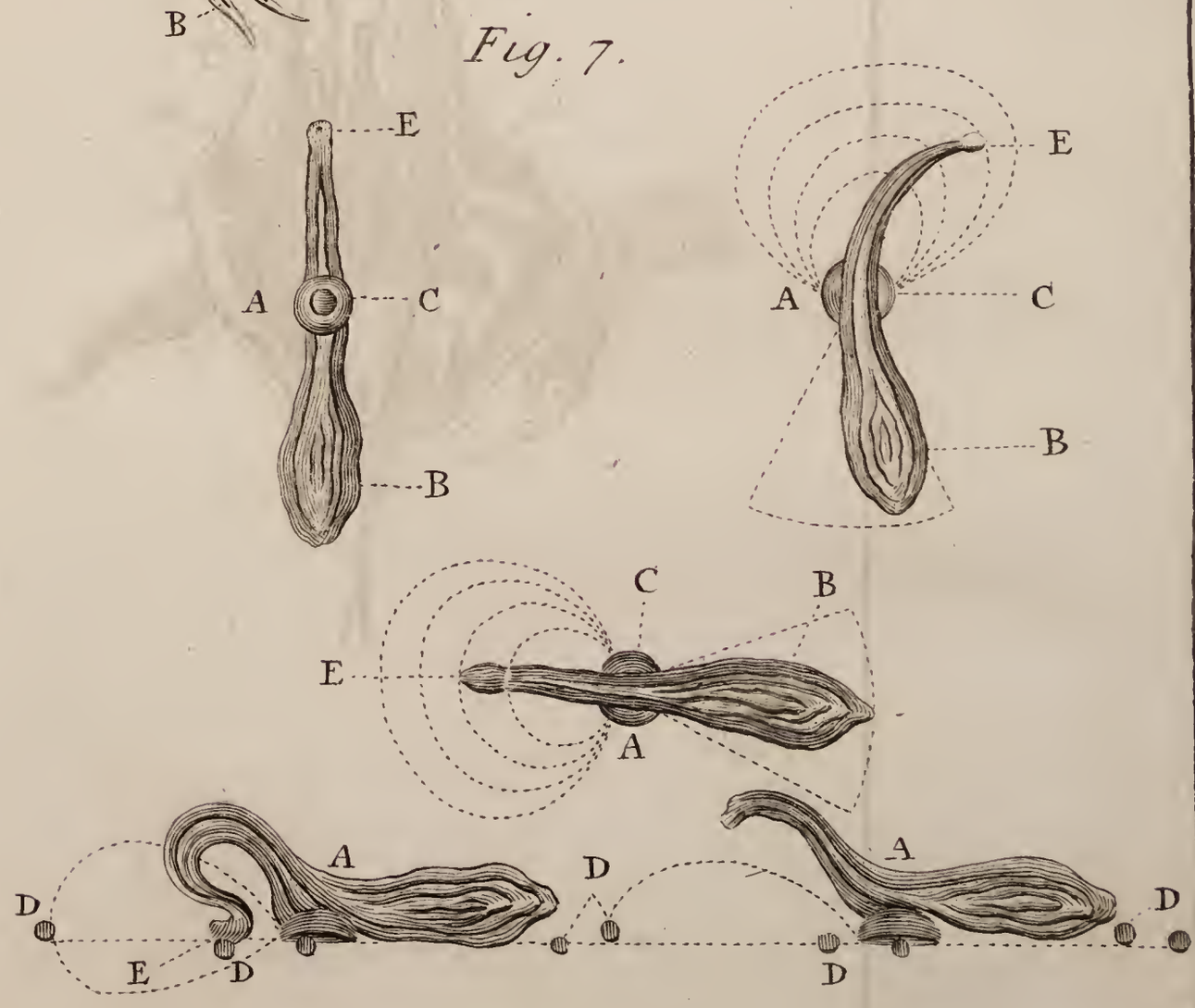


Fig. 6.

Fig. 7.



it prolongs itſelf, and then it becomes ſlender, the Diminution being made by Degrees up to the Head; and ſometimes it contracts itſelf, and then, the Thickneſs encreaſing, it becomes all of an equal Bigneſs. The hinder Part CB does not change it's Figure, becauſe it moves but ſlowly, and very ſeldom. When this Inſect ſtops itſelf any where, it holds ſtrongly by means of the Protuberance. Before it applies it, it ſhortens it, by withdrawing the Edges, or the Circumference towards it's Centre; and after it has applied the Orifice of it's Protuberance upon the Surface of any Body, it lifts up a little the Centre, or Bottom, towards it's own Body; afterwards it ſwells it, and ſtretches it on all Sides, according to all it's Dimenſions. This Protuberance thus applied, ſtretched and void of Air, makes that which endeavours to enter, preſs it externally on all Sides, and hold it ſo faſt, that it is above the Strength of the Animal to ſeparate it from it's Place where it is applied. This Animal being thus faſtened, and detained by it's Protuberance, it's fore Part is always in Motion, whilſt it's hinder Part remains almoſt immoveable. It ſtretches it's Head ſometimes to the Right Hand, ſometimes to the Left, by lengthening and ſhortening it's fore Part, which bends and ſtreightens itſelf very frequently. I have marked the Extent of all theſe Motions by pricked Circles of different Bigneſſes, all which touch one another at one Point of their Circumference, at the Center of the Protuberance, which is as it were the Beginning and fixed Point of all theſe Motions. When this little Animal deſires to change it's Place, it makes uſe of it's Protuberance and it's Sucker, which is the little Hollow under it's Head, and ſeems to ſerve it for a Mouth: It applies this Part to the Place D, whither it would remove it's Body, and after being prolonged by it's fore Part to reach the Place, where this Application ſhould be made, it draws it's Protuberance and Sucker together, by bending it's fore Part circularly, after the Manner of ſome *Caterpillars*. It's Protuberance being applied, it looſens it's Sucker and prolonging itſelf, applies it to another Place more forward: The Sucker being faſtened, it bends itſelf circularly again to bring the Protuberance up to it, and apply it as before. By this we ſee that the Worm prolongs itſelf to apply it's Sucker, and contracts itſelf to do the ſame with it's Protuberance. Thus theſe Motions and Applications are made ſucceſſively, and as often as there is occaſion. The hinder Part faſtens itſelf to nothing, but is always drawn by the Part which goes before it.

This little Animal did not live above two Hours after it was taken out of the Place where I found it. It grew languid as ſoon as it was expoſed to the Air, and recovered ſome Vivacity as ſoon as it was put into a little Sea-water. As ſoon as it was put in the Water, it ſent out from it's Mouth a little green, almoſt imperceptible, Thread, which kept itſelf ſuſpended in the Water, and was about as long as it's Body, and was as fine as the fineſt Thread of a Spider's Web:

After this Thread was put forth, it emitted alſo from the ſame Place ſome little Bubbles of Air. The Body of the Worm decreaſed in Bulk by little and little as long as it was alive, and after it's Death, this Diminution either ceaſed, or became leſs ſenſible. Having cut it's Belly through with a Pair of Sciſſars, as ſoon as it was dead, and ſqueezed it, there came out a black, thick, Liquor.

From theſe Facts we can draw but very ſlender Conſequences. It is certain that this Inſect cannot live out of the Water; ſo that one cannot imagine it could live in the Stomach of any Land-Animals, unleſs they came near the Nature of the Amphibious; for the Worms which grow upon, or within the Bodies of Animals, ought to be of the ſame Nature with them, with Regard to the Elements in which they live. Our Worm ſeems to be incapable of living any where but in the Bodies of Fiſh, ſeeing it kept alive but a very little Time in the Sea-water, in which I put it, having been expoſed to the Air but one Moment at two different Times; which was not ſufficient to alter it's Parts, and cauſe it's ſudden Death. The almoſt immediate Diminution of it's Bulk in the Water is another Mark that it cannot live in the Sea out of the Body of the ſame Fiſh; for if the Water, which was more natural to it than the Air, was injurious to it, much more would the Air, to which I expoſed it, have been prejudicial. The fine Fibre which it put forth, and the Decreaſe of it's Bigneſs, were ſigns that it ſuffered ſome Uneaſineſs. The black and thickiſh Juice, which came out of it's Entrails, could be nothing but ſome half coagulated Blood, which it had ſucked in the Stomach of the Fiſh.

As the *Bonite* is a Fiſh of Prey, living on other ſmaller Fiſhes, it is probable that this little *Leach* uſually faſtens itſelf on thoſe which come into the Stomach, and that it lives on their Blood.

The Stomach, in which I found it, was quite empty, ſo that it was probably as hungry as the *Bonite* could be; for this Fiſh is not eaſy to be catched but when hungry. However, it was the firſt Time I found it ſo very empty, though I have ſeen a great Number opened.

Concerning the ſtocking of the River Mene *with Oyſters, by the Rev. Mr* Rowlands, N°. 369. p. 250.

VIII. The River of *Mene*, that divides *Angleſey* from *Carnarvonſhire*, has at preſent the Bottom of it's Channel for ſome Miles in length, all bedded with good Oyſters, in ſuch Plenty, that in the Seaſon, ſeveral Boats are daily employed to dredge them up, and have done ſo theſe eight or nine Years laſt paſt to their great Profit; but what I recommend as obſervable, is, that about twenty four Years ago, we have good Aſſurance, that there were none to be found on that Bottom: but that a Gentleman about that Time, cauſed three or four hundred large Oyſters to be dropped into the Channel, juſt under his Land; from the Spat or Seed of which, it is moſt probable, the Flux and Reflux of Tides diſperſing it, all the Bottom at length, where ſmall Stones and a large Cultch received

the Sperm, became covered with Oyſters. And what favours this Conjecture, that they are a Brood of Oyſters begun at that Time, is, that at the firſt finding, they appeared young and ſmall, but have ſince yearly increaſed in Bulk and Plenty, though prodigious Quantities have been taken up of them.

A Hermaphrodite Lobſter diſſected by F. Nicholls, *M. D. F. R. S.* N°. 413. p. 290.

IX. It is not eaſy to conceive, how an Hermaphrodite can be formed in a Species whereof each Sex has the Parts ſubſervient to Generation, ſingle and neceſſarily ſituated in the ſame Parts of the Body; at leaſt without either a very remarkable Mal-formation of the Body in general, or ſo perverted a Situation of thoſe Parts, as muſt very much impair their Uſes. But in thoſe Animals whoſe Parts of Generation are double and independant on each other, as the Lobſter, Crab, and many Birds, the Parts proper to both Sexes may poſſibly be formed in the ſame Subject without Prejudice to their Uſes: But in that Caſe the ſeveral Parts can be but ſingle; and conſequently, the Subject ſo formed cannot be termed perfect as to it's Species, in regard to either Sex, though it may be perfectly of both Sexes ſo far as regards Generation.

Under this Idea of a *Hermaphrodite*, I may venture to ſay, the Lobſter referred to my Examination is truly one; and, if ſplit from Head to Tail, is Female on the right Side, and Male on the left Side.

To illuſtrate this, I ſhall give a ſhort Account of the Structure of the male and female Lobſter, ſo far as relates to the Difference between the two Sexes, and then proceed to ſhew in what Manner they were combined in this Subject.

It has already been obſerved that the Lobſter, both male and female, has all the Parts of Generation double, except that the female has one Paſſage only, through which it is probable the *Ova* are emitted out of the Trunk, in Order to be affixed to the ſmall Appendages under the Tail.

The *Penis* of the male Lobſter ariſes from the Teſticle, and is no more than a Continuation of the *Vas deferens*; it is reflected and retorted once, after which it grows thicker, as to it's Subſtance (probably forming a *Corpus cavernoſum*) and terminates, not in the laſt Leg but one, as *Willis*, in his Treatiſe *de Animâ Brutorum* has obſerved, but at a ſmall perforated Tubercle in the firſt Bone of the laſt Leg. *Fig.* 8. A A, *the two* Penes.

Between the two laſt Legs and the two Legs above them are two Proceſſes, which, from their reſembling the *Nymphæ* of Women, I ſhall term *Nymphæform* Proceſſes. Theſe Proceſſes are covered with Hair, and unite at their Baſes without leaving any Paſſage. B B.

Below the two laſt Legs, towards the Tail, are two Appendages, which, from their Similitude, I ſhall term the *Styliform Appendages*. Theſe in the Male are thick, hard, and void of Hair. C C.

The Tail is continued from the Trunk in a gradual Decreaſe of it's Dimenſion, and is covered by Plates, which extend themſelves but little below the Subſtance of the Tail, and terminate in acute Angles, without any Ways diverging. D D.

It is to be obſerved, that ſometimes theſe Plates are edged with ſhort and thin Hair, and ſometimes have no Hair.

The Female on the other Hand, in the Place of the Teſticle has an Ovary, which, like the Teſticle, extends itſelf from the Stomach to near one half of the Tail. From the Middle of the Ovary a Duct deſcends to the Legs, which opens at a round Hole edged with Hair
Fig. 9. in the firſt Bone of the laſt Leg but two: This is the *Uterus*. A A, *the Entrance into the two* Vaginæ.

The two Proceſſes, (B B), which I have termed *Nymphæform*, in the Female make a more obtuſe Angle at the Union of their Baſes; are leſs hairy, and leave a Paſſage (D), through which it is probable the *Ova* are emitted, to be affixed to the Appendages under the Tail.

The two Styliform Appendages in the Female are ſoft, thin, and edged with long Hair, C C.

The Plates covering the Tail are extended much farther under the Tail than in the Males, beſide which they diverge, in order to leave a greater Space for containing the *Ova*; for the better Defence of which they terminate broad, and are edged with thick and long Hair, F F.

In the *Hermaphrodite Lobſter* I found all theſe Parts proper to both Sexes regularly diſpoſed, but in ſuch Manner that the Parts proper to the Female were to be found only on the right Side, and the Parts proper to the Male only on the left Side.

Fig. 10. In the antepenultimate Leg the *Os uteri* (A), was very obvious on the right Side, as in the Females, but had not the leaſt Mark of any ſuch Paſſage in the ſame Leg on the left Side.

The *Nymphæform Proceſs* on the right Side made an obtuſe Angle at it's Inſertion into the Body, and was ſoft and perforated as in the Females, while the correſponding Proceſs made a leſs Angle, was more hairy and rigid at it's Baſis, as in the Male, B.

The *Styliform Proceſs* on the right Side (D) was ſoft, flat, and edged with Hair, as in the Female; but on the left Side (E) it was ſtiff, hard, and void of Hair.

In the laſt Leg on the left Side the perforated Tubercle for the Paſſage of the *Penis* (H) (as in the Male) was very conſpicuous, but without the leaſt Appearance of ſuch Tubercle in the correſponding Leg on the right Side.

The Plates covering the Tail (F) were extended on the right Side conſiderably below the Subſtance of the Tail, and were edged with thick and long Hair, and terminated broad, as in Females.

Fig. 8.

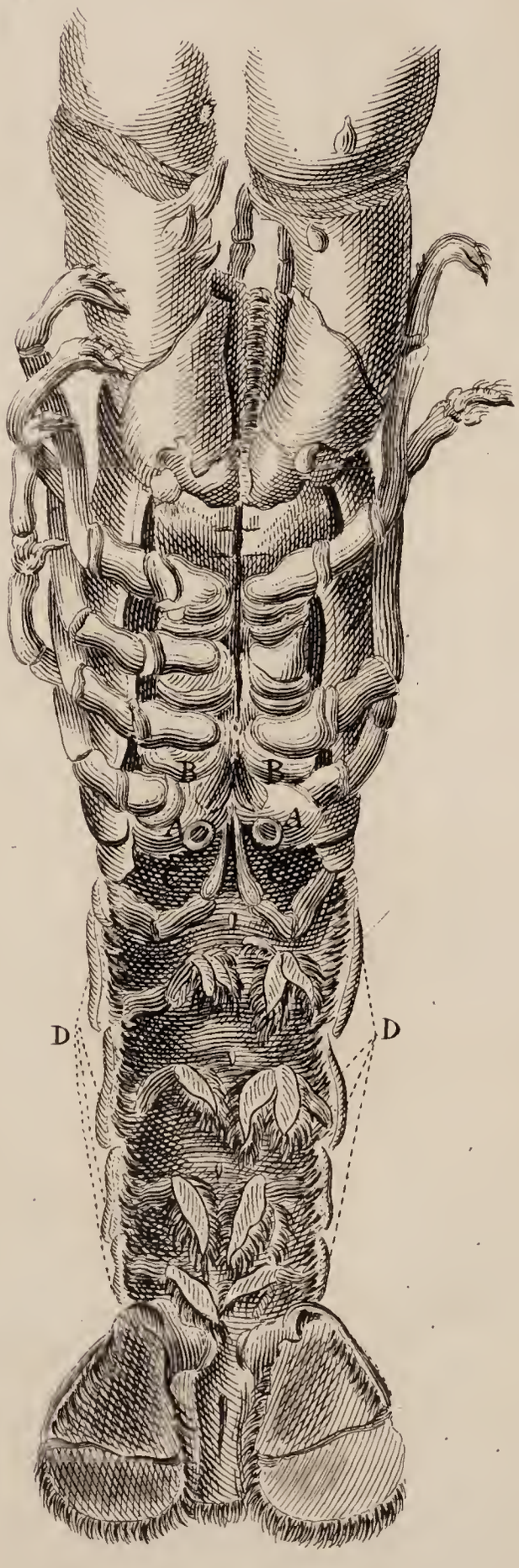
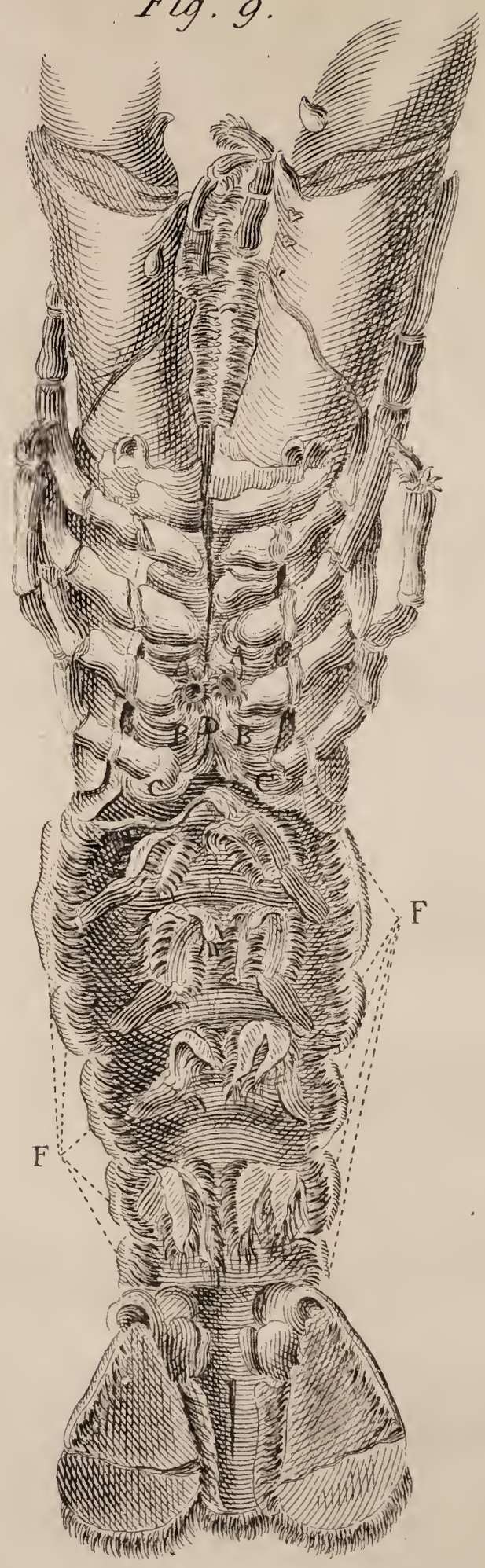


Fig. 9.



Toms Sculpt.

On the left Side, theſe Plates were much leſs extended below the Tail; were almoſt totally void of Hair, and terminated in acute Angles, (G).

Theſe Plates diverged likewiſe on the right Side, as in the Females, but not on the left Side, as in the Males. A, *the diverging of the Plates on the right Side*; B, *the Plates no Ways diverging.* *Fig.* 11.

Upon removing Part of the great Shell, I found the internal Parts of Generation in both Sexes exactly correſponding to thoſe externally deſcribed.

In the right Side adjacent to the Heart, the *Ovary* (F) was regularly diſpoſed, it was full of *Ova*, and ſent off it's *Oviduct* or *Uterus* (G), to the antepenultimate Leg.

In the left Side the Teſticle was rightly diſpoſed as to it's Form, Subſtance, and Situation; Part of which I was obliged to remove, in Order to ſhew the *Penis* (E), which terminated as in all Males, at the Tubercle in the firſt Joint of the laſt Leg. I, *Part of the Teſticle unremoved.*

I had ſome Thoughts of removing ſo much of the great Shell as was neceſſary to ſhew the Courſe and Terminations of the *Uterus* and *Penis*, at their proper Orifices. But conſidering that by that Means the Tail would too eaſily ſeparate from the Trunk, and the Appearances of the other Marks be rendered leſs obvious, I choſe only to lay them open at the Back, believing that to be ſufficiently ſatisfactory to thoſe who underſtand the Structure of that Animal. I have ſteeped it in three different Spirits, and carefully diſpoſed it in a Glaſs, which I have ſtopped in the beſt Manner I can, that it may remain in the Repoſitory, as an undeniable Proof of ſo remarkable a Fact.

Of the degenerating of Smelts, in New-England, *by the Hon.* Paul Dudley *Eſq; F. R. S.* No. 374. p. 232.

X. Two ſhort Miles from my Houſe we have a fine Pond, of half a Mile over, with little or no Communication with the Sea. An ingenious man, ſome threeſcore Years ago, for an Experiment, took a Pail of large Smelts from the River and put them into this Pond, where they have increaſed abundantly, but are degenerated to a very ſmall ſort; for our River-Smelts I ſuppoſe are full as large as thoſe of the *Thames*, ſome of them I know, will weigh two Ounces and a half, whereas theſe ſmall ones will not weigh five Penny-Weight. We reckon the Pond-Smelt eats much better than the other, they are very tranſparent, and of a beautiful ſhining Pearl-Colour.

Ambergris *found in* Whales, *communicated by Dr* Boylſton *of* Boſton *in* New-England, No. 385. p. 193.

XI. 1. The moſt learned Part of Mankind are ſtill at a Loſs about many Things, even in Medical Uſe; and, particularly, were ſo in what is called *Ambergris*, until our *Whale* Fiſhermen of *Nantucket*, in *New-England*, ſome three or four Years ago, made the Diſcovery.

Cutting up a *Sperma Ceti* Bull *Whale*, they found accidentally in him, about twenty Pound Weight, more or leſs, of that Drug. After which, they, and other ſuch Fiſhermen, became very curious in ſearching

ſearching all ſuch Whales they killed; and it has been ſince found in leſſer Quantities, in ſeveral Male Whales of that Kind, and in no other, and that ſcarcely in one of an Hundred of them. They add further, that it is contained in a Cyſt, or Bag, without any inlet or outlet to it, and that they have ſometimes found the Bag empty, and yet entire.

The Bag is no where to be found, but near the Genital Parts of the Fiſh. The *Ambergris* is, when firſt taken out, moiſt, and of an exceeding ſtrong and offenſive Smell.

An Eſſay upon the Natural Hiſtory of Whales, with a particular Account of the Ambergris found in the Sperma Ceti *Whale, by the Hon.* Paul Dudley, *Eſq; F. R. S.* N°. 387. p. 256.

2. The following Account reſpects only ſuch Whales, as are found on the Coaſt of *New-England.* And of theſe there are divers Sorts.

The Whale-bone Whale.

The Right, or Whalebone, Whale is a large Fiſh, meaſuring ſixty or ſeventy Feet in Length, and very bulky, having no Scales, but a ſoft fine ſmooth Skin, no Fins, but only one on each Side, from five to eight Feet long, which they are not obſerved to uſe, but only in turning themſelves, unleſs while young, and carried by the Dam on the Flukes of their Tails; when with thoſe Fins they claſp about her Small, and ſo hold themſelves on. This Fiſh, when firſt brought forth, is about twenty Feet long, and of little Worth, but then the Dam is very fat. At a Year old, when they are called Short-heads, they are very fat, and yield to fifty Barrels of Oil, but by that Time the Dam is very poor, and termed a Dry-ſkin, and will not yield more than thirty Barrels of Oil, tho' of large Bulk. At two Years old, they are called Stunts, being ſtunted after weaning, and will then yield generally from twenty four to twentyeight Barrels. After this, they are termed Scull-fiſh, their Age not being known, but only gueſſed at by the Length of the Bone in their Mouths. The Whale-bone, ſo called, grows in the upper Jaw on each Side, and is ſometimes ſix or ſeven Feet in Length. A good large Whale has yielded a thouſand Weight of Bone. 'Tis thought by ſome, that the hairy Part of the Whale-bone, and which is next to the Tongue, ſerves in the Nature of a Strainer of their Food.

The Eye of a Whale is about the Bigneſs of an Ox's Eye, and ſituated in the After-part of the Head on each Side, and where the Whale is broadeſt; for his Head tapers away forward from his Eyes, and his Body tapers away backward; his Eyes are more than half way his Depth, or neareſt his Under-part; juſt under his Eyes are his two Fins before-mentioned; he carries his Tail horizontally, and with that he ſculls himſelf along.

The Entrails of this Whale are made and ſituated much like thoſe of an Ox, and their Scalps are ſometimes found covered with Thouſands of Sea-lice. One of theſe Whales has yielded One hundred and thirty Barrels of Oil, and near twenty out of the Tongue. The Whale-bone Whale is the moſt valuable, except the *Sperma Ceti* Whale.

The

Fig. 10.

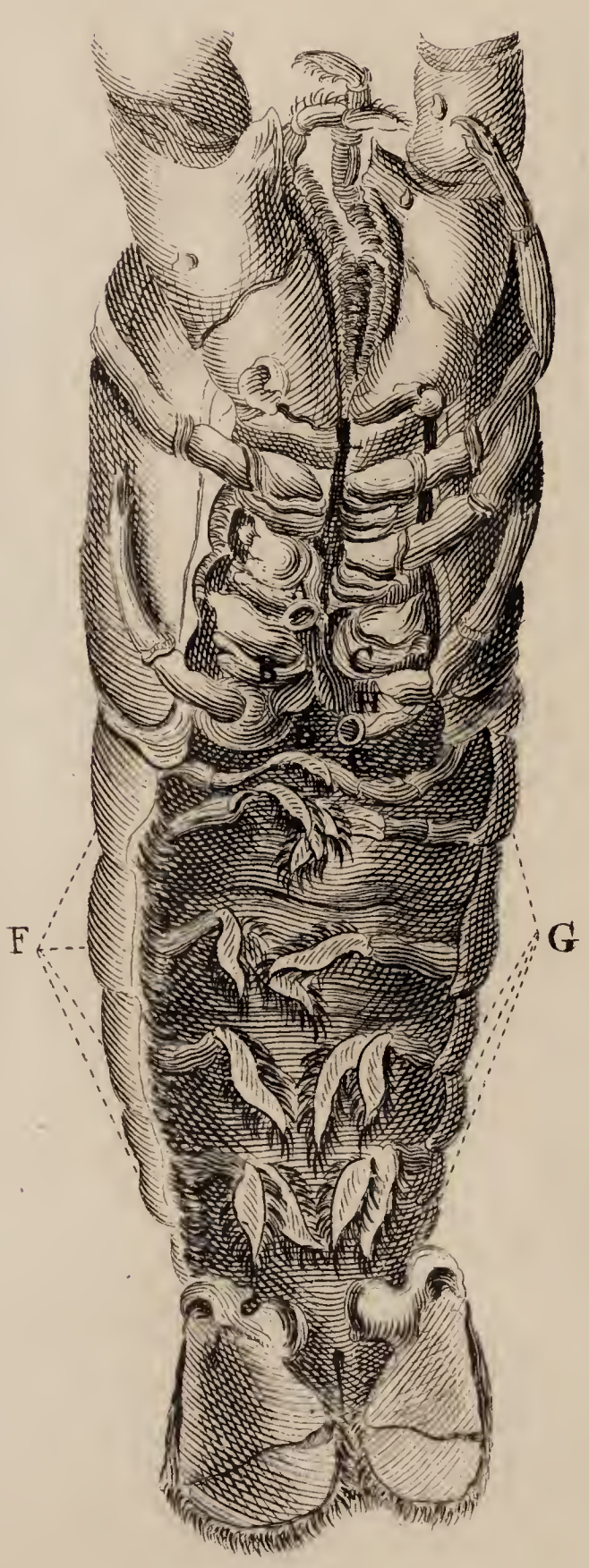
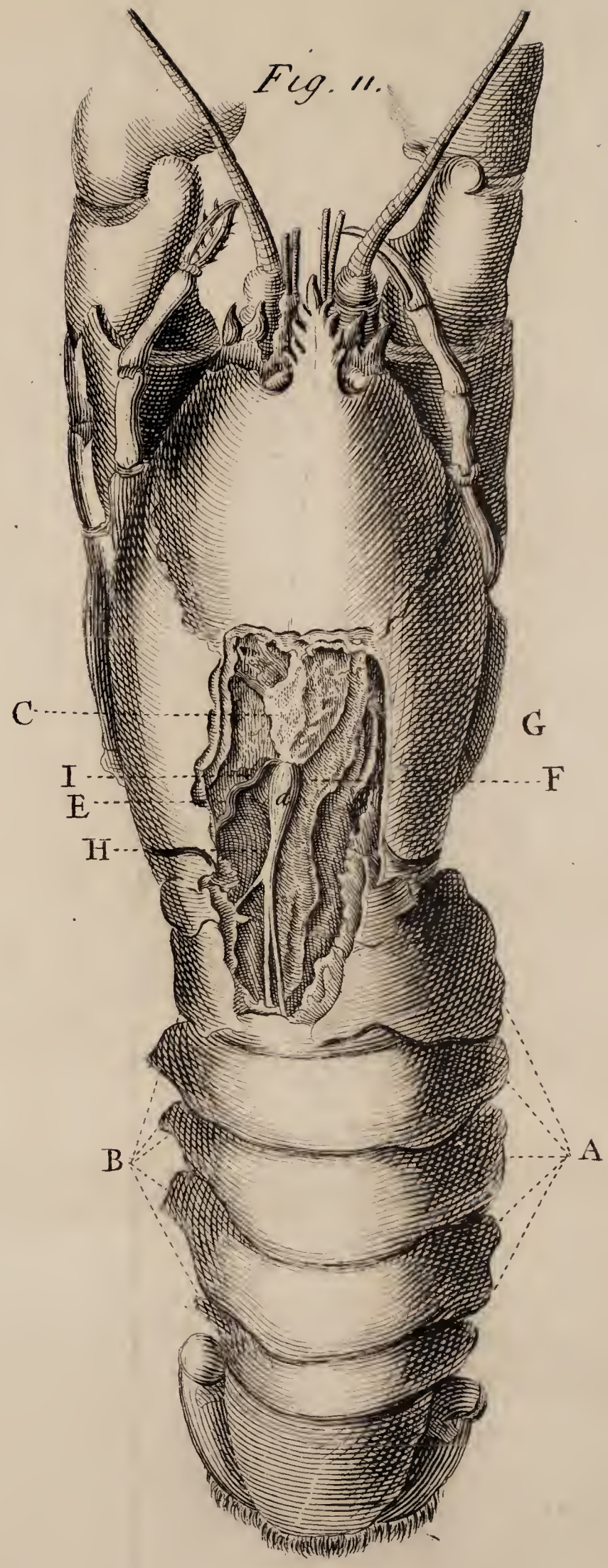
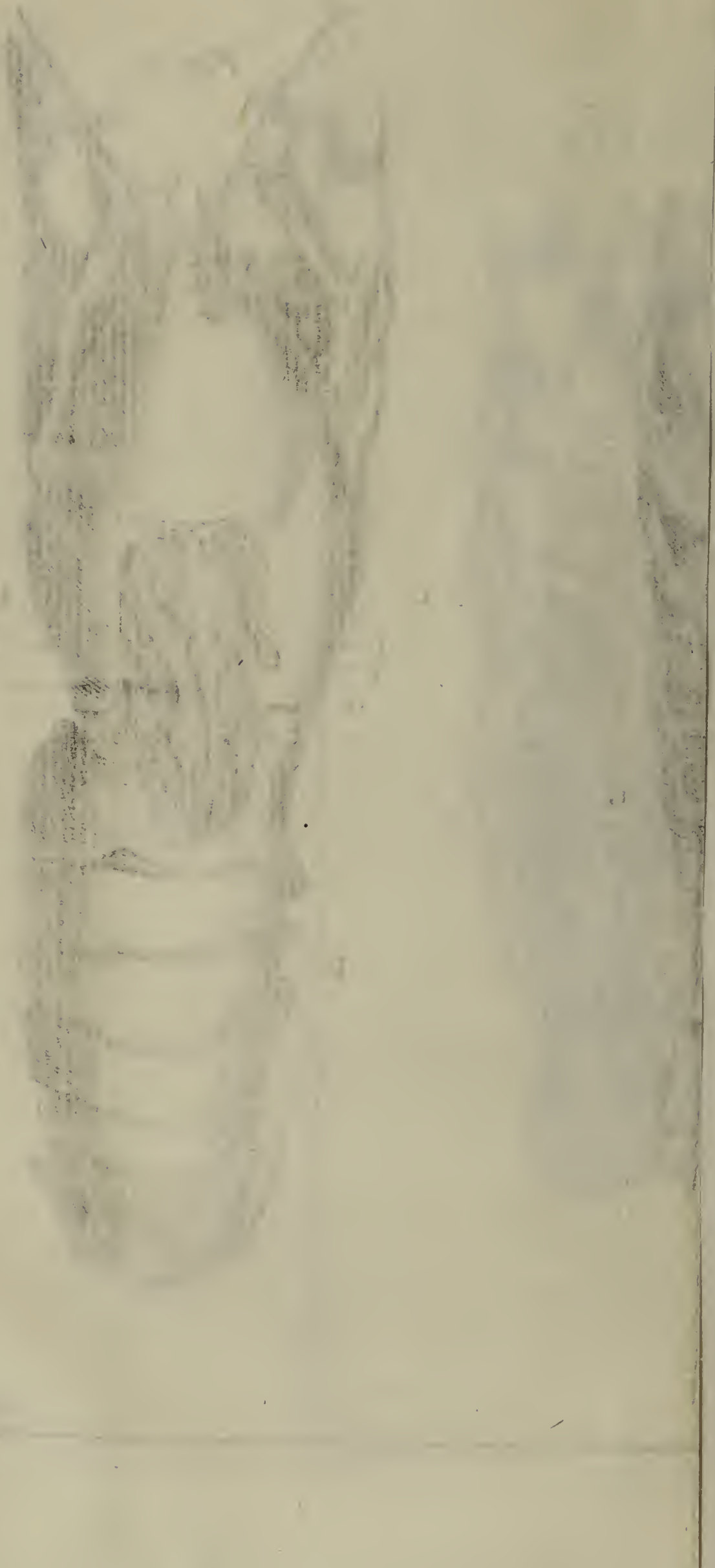


Fig. 11.



Toms Sculp.



The Scrag Whale is near a kin to the Fin-back, but, inſtead of a Fin upon his Back, the Ridge of the After-part of his Back is ſcragged with half a Dozen Knobs; he is neareſt the right Whale in Figure and for Quantity of Oil; his Bone is white, but will not ſplit. *The Scrag Whale.*

The Finback Whale is diſtinguiſhed from the right Whale, by having a great Fin on his Back from two Feet and a Half, to four Feet long, which gives him the Name; he has alſo two ſide Fins, as the Whale-bone Whale, but much longer, meaſuring ſix or ſeven Feet. This Fiſh is ſomewhat longer than the other, but not ſo bulky, much ſwifter, and very furious when ſtruck, and very difficultly held; their Oil is not near ſo much, as that of the right Whale, and the Bone of little Profit, being ſhort and knobby. The Belly of this Whale is white. *The Finback Whale.*

The Bunch or humpback Whale, is diſtinguiſhed from the right Whale, by having a Bunch ſtanding in the Place where the Fin does in the Finback. This Bunch is as big as a Man's Head, and a Foot high, ſhaped like a Plug pointing backwards. The Bone of this Whale is not worth much, tho' ſomewhat better than the Finback's. His Fins are ſometimes eighteen Feet long, and very white; his Oil much as that of the Finback. Both the Finbacks and Humpbacks are ſhaped in Reeves longitudinal from Head to Tail on their Bellies and their Sides, as far as their Fins, which are about half way up their Sides. *The Bunch or humpback Whale.*

The *Sperma Ceti* Whale. This Fiſh is much of the ſame Dimenſion with the other, but of a greyiſh Colour, whereas the others are black; he has a Bunch on his Back like the Humpback, but then he is diſtinguiſhed by not having any Whale-bone in the Mouth; inſtead of which, there are Rows of fine ivory Teeth in each Jaw, about five or ſix Inches long. One of theſe Teeth I have ſent the Society. The Man, who gave it me, ſays, the Whale was forty nine Feet long, and his Head made twelve Barrels of *Sperma Ceti* Oil. They are a more gentle Fiſh than the other Whales, and ſeldom fight with their Tails; but when ſtruck, uſually turn upon their Backs, and fight with their Mouths. The Oil, which is made of the Body of this Fiſh is much clearer and ſweeter than that of the other Whales. *The Sperma Ceti Whale.*

The *Sperma Ceti* Oil, ſo called, lies in a great Trunk about four or five Feet deep, and ten or twelve Feet long, near the whole Depth, Breadth, and Length of the Head, in the Place of the Brains, and ſeems to be the ſame, and diſpoſed in ſeveral membranous Cells, and covered not with a Bone, but a thick griſly Subſtance below the Skin, through which they dig a Hole, and lade out the clear Oil. Not but that the Head, and other Glandulous Parts of this Fiſh, will make the *Sperma Ceti* Oil; but the beſt, and that which is prepared by Nature, is in the Trunk aforeſaid: And an ingenious Man, who has *The Sperma Ceti Oil.*

has himſelf killed many of theſe Whales, aſſures me, that only the Trunk will afford from ten to twenty Barrels. Beſides the *Sperma Ceti* Oil, this Fiſh will yield from twenty to fifty Barrels of common Oil.

The Propogation of Whales. They generate much like our neat Cattle, and therefore they are termed Bull, Cow, and Calf. They bring forth but one at a Time, and but every other Year. When the Cow takes Bull, ſhe throws herſelf upon her Back, ſinking her Tail, and ſo the Bull ſlides up, and, when he is ſlid up, ſhe claſps him with her Fins. A Whale's Piſſel is ſix Feet long, and at the Root is ſeven or eight Inches Diameter, and tapers away till it comes to about an Inch Diameter: his Stones would fill half a Barrel, but his Genitals are not open or viſible, like thoſe of the true Bull. The Calf, or young, Whale, has been found perfectly formed in the Cow, when not above ſeventeen Inches long, and white; yet, when brought forth, is uſually twenty Feet, but of a black Colour; it is ſuppoſed they go with their Young about nine or ten Months, and are very fat in that Time, eſpecially when they bring forth. When the Female ſuckles her Young, ſhe turns herſelf almoſt upon her Back, upon the Rim of the Water, ſhe has two Teats of ſix or eight Inches long, and ten or twelve Inches round. The Milk is white, like that of a Cow; and upon opening a young ſucking Whale, the Milk was found curdled in his Bag, juſt like that of a Calf.

Their Care of their Young. Their Care of their Young is very remarkable, they not only carrying them on their Tails, and ſuckling them, but often riſing with them for the Benefit of the Air; and however they are chaſed or wounded, yet as long as they have Senſe, and perceive Life in their Young, they will never leave them, nor will they then ſtrike with their Tail, and if, in their running, the young one loſes his Hold and drops off, the Dam comes about, and paſſing underneath, takes it on again. And therefore Care is taken by thoſe who kill theſe Mate Fiſh (as they are called) only to faſten the Calf, but not to kill her, till they have firſt ſecured the Cow. For ſo ſoon as ever the Calf is dead, the Cow perceives it, and grows ſo violent, that there is no managing her.

Whales very gregarious. The Whales are very gregarious, being ſometimes found a Hundred in a Scull, and are great Travellers. In the Fall of the Year, the Whale-bone Whales go Weſtward, and in the Spring they are headed Eaſtward. But here it muſt be noted, that the ſeveral Kinds of Whales do not mix with one another, but keep by themſelves.

Reſpiration. Their Way of Breathing is by two Spout-Holes in the Top of the Head. The *Sperma Ceti* has but one, and that on the left Side of the Head. Once in a Quarter of an Hour, when not diſturbed, they are obſerved to riſe and blow, ſpouting out Water and Wind, and to draw in freſh Air: but, when purſued, they will ſometimes keep under

under Water half an Hour or more; though it is obſerved when any Cow has her Calf on her Tail, ſhe riſes much oftner for the young one to breathe, without breathing herſelf. Out of their breathing Holes they ſpout great Quantities of Blood, when they have received their Death Wound.

For the firſt Year they all ſuck the Dam. After they are weaned, the right Whales, as is generally ſuppoſed, live upon ſome ouzy Matter, which they ſuck up from the Bottom of the Sea. The Triers, that open them when dead, acquaint me, that they never obſerved any Graſs, Fiſh, or any other Sort of Food in the right or Whalebone Whale, but only a greyiſh ſoft Clay, which the People call *Bole Armoniac*; and yet an experienced Whale-man tells me, that he has ſeen this Whale in ſtill Weather, skimming on the Surface of the Water, to take in a Sort of reddiſh Spawn, or Brett, as ſome call it, that at ſome Times will lie upon the Top of the Water, for a Mile together. Here alſo it may be obſerved, that though the Body of this Whale is ſo very bulky, and ſo exceeding fat; yet when cut open, they are ſeldom found to have much more Draught than that of an Ox, and they dung much as neat Cattle do. Their Swallow is not much bigger than an Ox's; but the Finback Whale has a larger Swallow: for he lives upon the ſmaller Fiſh, as Mackarel, Herring, *&c.* great Sculls of which they run through, and, with a ſhort Turn, cauſe an Eddy or Whirlpool, by the Force of which, the ſmall Fiſh are brought into a Cluſter; ſo that this Fiſh, with open Mouth, will take in ſome Hundreds of them at a Time. The *Sperma Ceti* Whale, beſides other Fiſh, feeds much upon a ſmall Fiſh that has a Bill; our Fiſhermen call them Squid Fiſh. The ſmall Peices of theſe Squid Bills are plainly to be diſcerned in the Ambergris, and may be picked out of it; they appear glazy,, and like little Pieces of broken Shells. *Their Food.*

Mr *Harris* in his *Bibliotheca Navigantium*, &c. has given a very particular Account of the Method of taking Whales at *Greenland*, and though our way in *New England* differs very much from that, yet I ſhall wave it, as not ſo ſtrictly appertaining to Philoſophy. Only I would take notice of the Boats our Whale-men uſe in going from the Shoar after the Whale, They are made of Cedar Clapboards, and ſo very light, that two Men can conveniently carry them, and yet they are twenty Feet long, and carry ſix Men, *viz.* the Harponeer in the Fore-part of the Boat, four Oar-men, and the Steerſman. Theſe Boats run very ſwift, and by reaſon of their Lightneſs can be brought on and off, and ſo kept out of Danger. The Whale is ſometimes killed with a ſingle Stroke, and yet at other Times ſhe will hold the Whale-men in Play, near half a Day together, with their Lances, and ſometimes will get away after they have been lanced and ſpouted Blood, with Irons in them, and Drugs faſten'd to them, which are thick Boards about fourteen Inches ſquare. Our People formerly uſed to kill the Whale near the Shore; but now they go off *The way of killing Whales.*

to Sea in Sloops and Whale boats, in the Months of *May*, *June*, and *July*, between *Cape-Cod* and *Bermudas*; where they lie by in the Night, and ſail to and again in the Day, and ſeldom miſs of them; they bring home the Blubber in their Sloops. The true Seaſon, for taking the right or Whalebone Whale, is from the Beginning of *February*, to the End of *May*; for the *Sperma Ceti* Whale, from the Beginning of *June*, to the End of *Auguſt*. And it has been obſerved by our Fiſhermen, that when a *Sperma Ceti* Whale is ſtruck, he uſually, if not always, throws the Excrements out of the *Anus*.

Their prodigious Strength.

The wonderful, and even prodigious, Strength of this Creature, lies principally in their Tail, that being both their offenſive and defenſive Weapon. Many Inſtances of this Kind I have had from credible Perſons, who were Eye-witneſſes; I will mention but a few. A Boat has been cut down from Top to Bottom with the Tail of a Whale, as if cut with a Saw, the Clap-boards ſcarce ſplintered, tho' the Gunnel upon the Top is of tough Wood. Another has had the Stem, or Stern-poſt of about three Inches through, and of the toughеſt Wood that can be found, into which the Ends of the Cedar Clap-boards are nailed, cut off ſmooth above the Cuddee, without ſo much as ſhattering the Boat, or drawing the Nails of the Clap-boards. An Oar has been cut off with a Stroke upwards, and yet not ſo much as lifted up out of the Thole-pin. One Perſon had an Oar cut off, while in his Hand, and yet never felt any Jarring.

A few Years ſince, one of the Fin-back Whales came into a Harbour near *Cape-Cod*, and towed away a Sloop of near forty Tun, out of the Harbour into the Sea. This Accident happened thus: It is thought the Whale was rubbing herſelf upon the Fluke of the Anchor, or going near the Bottom, got the Fluke into her Niſket, or the Orifice of the *Uterus*, and finding herſelf caught, tore away with ſuch Violence, that ſhe towed the Ship out of the Harbour, as faſt as if ſhe had been under Sail with a good Gale of Wind, to the Aſtoniſhment of the People on Shore, for there was nobody on board. When the Whale came into deep Water, ſhe went under, and had like to have carried the Sloop with her, but the Cable gave Way, and ſo the Boats that were out after her, recovered it. This Whale was found dead ſome Days after on that Shore, with the Anchor ſticking in her Belly.

After a Whale is dead, it has been obſerved, that the ſame way the Head lies, ſo the Head will lie if not forcibly turned, and let the Wind blow which Way it will, that Way they will ſcull a Head, tho' right in the Eye of the Wind, and they are much eaſier towed to the Shore, if they die that Way with their Head, than any other.

Their Enemies.

The Enemies of the Whale, or the Fiſh that prey upon the Whales, and often kill the young ones, for they will not venture upon an old one, unleſs much wounded. Our Whale-men have given this

Fiſh

Fish the Name of Killers. These Killers are from twenty to thirty Feet long, and have Teeth in both Jaws that lock one within another. They have a Fin, near the middle of their Backs, four or five Foot long. They go in Company by Dozens, and set upon a young Whale, and will bait him like so many Bull-dogs; some will lay hold of his Tail to keep him from threshing, while others lay hold of his Head, and bite and thresh him, till the poor Creature, being thus heated, lolls out his Tongue, and then some of the Killers catch hold of his Lips, and if possible of his Tongue; and after they have killed him, they chiefly feed upon the Tongue and Head, but when he begins to putrify, they leave him. This Killer is without doubt the *Orca*, that Dr *Frangius* describes in his Treatise of Animals. His Words are these, *Quando Orca insequitur Balænam, ipsa Balæna horribilem edit Mugitum, non aliter quam cum Taurus mordetur a Cane.* These Killers are of such invincible Strength, that when several Boats together have been towing a dead Whale, one of them has come and fastened his Teeth in her, and carried her away down to the Bottom in an Instant. And sometimes they have bit out a Piece of Blubber of about two Foot square, which is of that Toughness, that an Iron, with little Beards being stuck into it, will hold it till it draws the Boat under Water. The Killers are sometime taken, and make good Oil, but have no Whale-bone. The Carcases of Whales in the Sea, serve for Food for Gulls, and other Sea-Fowl, as well as Sharks, for they are not very nice.

Many and various have been the Opinions even of the learned World, as to the Origin and Nature of *Ambergris*; some have reckoned it a *Bitumen*, and to issue from the Entrails of the Earth; others that it was produced from some Insect, as Honey, Silk, *&c.* The famous Mr *Boyle*, as I find it, in the Second Volume of *Lowthorp*'s *Abridgment of the Philosophical Transactions*, communicates an Account of Ambergris, from a *Dutch* Merchant, who first denies it to be the Scum or Excrement of a Whale, and then gives it, as his Opinion, that it is a fat Gum that issues from the Root of a Tree, and that you may raise it in Quantities by planting those Trees by the Shore, and so the Stream will cast it up to great Advantage. But it is now found out, that this *Occultum Naturæ* is an Animal Production, and bred in the Body of the *Sperma Ceti* Whale, analogous to what is found in some Animals of the Land, as the Musk Hog or *Taiacu*, the Musk Deer, the Bezoar Sheep, and some Amphibious Animals, as the Musquash, *&c.* who have their valuable Scent in a particular *Cystis* or Bag. I am apt to think, that which first gave Occasion to the Notion of Ambergris being the Production of the Whale, was because it was found in considerable Quantities on the Shores of the Summer Islands, and among the *Bahama*'s, where the dead Whales are frequently wreck'd and broke up with the Sea, and the Ambergris found floating, or on the Shore; but here again, the Ingenious, un- *Ambergris.*

til very lately, were at a Loſs, and divided in Opinion, for though they agreed it to come from the Whale, yet ſome took it to be the true and proper *Semen*, being found only in the Bull, at the Root of the *Penis*, near the Teſticles; others again thought it was the Ordure or Excrement of the Whale.

The beſt and moſt exact Account of Ambergris, that I have been able to procure, I very lately received from one Mr *Atkins*, now an Inhabitant at *Boſton* in *New England*, who uſed the Whale Fiſhery, for ten or twelve Years together, and was one of the firſt that went out a fiſhing for the *Sperma Ceti* Whales, about the Year 1670, and then began to diſcover the Ambergris; and being a ſober ingenious Man, what he ſays may ſafely be depended on; tho', for Subſtance, I have had it from ſeveral of the Whale-men.

His Relation, which was taken a few Days ſince from his own Mouth, is as follows:

" The Ambergris is found only in the *Sperma Ceti* Whales, and " conſiſts of Balls, or globular Bodies, of various Sizes, from about " three Inches to twelve Inches Diameter, and will weigh from a Pound " and an Half to twenty two Pounds, lying looſe in a large oval " Bag, or Bladder, of three or four Foot long, and two or three Foot " deep and wide, almoſt in the Form of an Ox's Bladder, only the " Ends more acute, or like a Blackſmith's long Bellows, with a " Spout running tapering into and through the Length of the *Penis*, " and a Duct, or Canal, opening into the other End of the Bag, and " coming from towards the Kidnies; this Bag lies juſt over the " Teſticles, which are above a Foot long, and is placed lengthways " at the Root of the *Penis*, about four or five Foot below the Navel, " and three or four Foot above the *Anus*. This Bag or Bladder is " almoſt full of a deep Orange coloured Liquor, not quite ſo thick " as Oil, and ſmelling ſtrong, or rather ſtronger of the ſame Scent " with the Balls of Ambergris, which float and ſwim looſe in it; the " Inſide of the Bag is very deeply tinged with the ſame Colour as the " the Liquor, which may alſo be found in the Canal of the *Penis*; " the Balls ſeem to be pretty hard while the Whale is alive, inaſmuch " as there are many Times found upon opening the Bag, large concave " Shells, of the ſame Subſtance and Conſiſtence, that have ſcaled off " from them, and the Balls themſelves ſeem to be compoſed of ſe- " veral diſtinct Coats incloſing one another, ſomething like the Coats " of an Onion."

As to the Number of Balls, Mr *Atkins* never found above four in a Bag, and in the Bag where he found one that weighed 21 Pounds, which was the largeſt he ever ſaw, there was no other.

He further ſays, " That to one *Sperma Ceti* Whale that has any of " theſe Balls, there are two, that have nothing but the deep Orange- " coloured Liquor aforeſaid in their Bags." This Remark confirms what another Whale-man told me, " That the Ambergris was found only

" only in ſuch *Sperma Ceti* Whales as are old and well grown." It is the the general Opinion of the Whale-men, that the Ambergris is produced only by the Male or the Bull *Sperma Ceti* Whale. As to this Particular, Mr *Atkins* ſays, " He never ſaw, nor certainly heard of, " a *Sperma Ceti* Female taken in his Life, the Cows of that Species " of Whales being much more timorous than the Males, and almoſt " impoſſible to be come at, unleſs when haply found aſleep on the " Water, or detained by their Calves." This is certain, the Boats can never come near them, when they are awake, they are ſo very ſhy and fearful.

Mr *Atkins*'s Method of getting the Ambergris out of the Whale was thus; after the Fiſh is killed, he turns the Belly upwards, and fixes a Tackle to the *Penis*, then cuts a Hole round the root of the *Penis*, thro' the Rim of the Belly, till he comes to the Entrails, and then ſearching for the Duct or Canal at the further End of the Bag, he ties it pretty near to the Bag, and cuts the Duct off beyond it, upon which he draws forth the *Penis* by the Tackle, and the Ambergris Bag, entirely follows it, and comes clean and whole out of the Belly.

The Rev. Mr *Prince* of *Boſton*, who took the preceeding Relation from Mr *Atkins*, apprehends the Bag aforeſaid to be the urinary Bladder, and the Ambergris Ball to be a certain Concretion, formed out of the greaſy odoriferous Subſtance of the Liquor aforeſaid contained within it. As for my own Part, I dare not pretend to give any Opinion upon the Point, but content myſelf with relating Matter of Fact.

XII. I cut a piece of Cod into ſmall Slices, ſome according to the length of the Fibres, and others directly acroſs them, in order to obſerve, whether theſe Muſcular Fibres were compoſed of great numbers of ſmall Veſſels running according to the length of the Fibre. And in effect I found, that when I had cut the Fibres dextrouſly thro', there appeared in the Microſcope as great a number of ſmall Veſſels running along theſe Fibres, as I had formerly ſeen in the Muſcular Fibres of a Whale. *Of the muſcular Fibres of Fiſh, by Mr* Lewenhoeck, *F. R. S.* N°. 368. p. 191.

But what appeared to me the moſt remarkable, was, that in a great number of Fibres, in which I was not able to diſcover any Veſſels running according to their length, I obſerved abundance of ſmall Veſſels, which ſeemed to me to proceed from the Membranes encompaſſing the Fibres. For in one Fibre, theſe Veſſels appeared to come out of the Circumference, or circular Tunicle of the Fibre, and to paſs on to the oppoſite part of the Tunicle. And in another Fibre, cut tranſverſly, I ſaw Veſſels ariſing from the Circumference, and dividing themſelves into ſmaller Branches about the middle of the Fibre; all which, as far as I could perceive, ended again in the Circumference of the Fibre. In one Fibre I ſaw at leaſt fifty of theſe Veſſels running through one another.

Upon this Diſcovery, I found I had been miſtaken in what I had at firſt imagined, which was, that the Veſſels, which aroſe from the Membranes,

Membranes, proceeded no farther, than juſt through the Tunicle of the Fibre, and ſo diſcharged the Fluid into the Fibre for it's Nouriſhment. Whereas, now I perceived, that the Veſſels, which aroſe from the Membrane, and entered into the Fibre, did not end there, but ſpread themſelves into ſmaller Branches proceeding every way from the inſide to the Tunicle of the Fibre. This cauſed me to think, that the nutritious Juice might circulate in theſe ſmall Veſſels, juſt as the Blood does in the Veins and Arteries; and that what the Muſcular Fibres received from them, might be no more than what ouzed thro' the Tunicles of theſe ſmall Veſſels, as in Land-Animals, which have no other end than the Artery coming from the Heart, and the Vein terminating in the Heart; the Artery and Vein thus making one continued Veſſel.

Having now a great number of Fibres lying before me, in which I could ſee very plainly the Veſſels juſt now treated of, yet I could not diſcern in the tranſverſe Sections of the Fibres any appearance of thoſe Veſſels, which run along their length, and compoſe the greateſt Part of the Body of each Fibre. This I imputed to the cutting of thoſe Veſſels not directly acroſs, but ſomething obliquely, by which their Apertures had been cloſed in ſuch a manner, that I could not perceive them, nor the leaſt Reſemblance of them.

I have ſeveral times obſerved, between the Muſcular Fibres of the Fiſh, a great number of Veſſels lying together, which compoſed what is commonly called a Membrane, which Veſſels ſurrounded the Muſcular Fibres, and lay ſo many of them together, that the thickneſs of the whole *Faſciculus* of Veſſels was equal to that of a Muſcular Fibre, and, as I imagined, was afterwards to be diſperſed in ſmaller Ramifications between the Fibres.

In taking a View of an entire Muſcle of a Cod-fiſh, and the Fibres of which it was compoſed, I found the thick end of the Muſcle to equal the Back of an ordinary Knife, and the thinner end not to exceed the thickneſs of a ſingle Fibre. Many of theſe Fibres are twice as long as the thickneſs of the Muſcle, and between the Muſcles lie what are commonly called Membranes, which are nothing elſe but a *Congeries* of Veſſels. Theſe Veſſels do not only run between the Fibres, but into the very Subſtance of every Fibre, as we ſee, when the Fibres are cut tranſverſly. By theſe Veſſels the Muſcular Fibres, and the entire Muſcles themſelves are ſo firmly bound together, that they ſerve inſtead of Tendons to one an another.

In like manner the Muſcular Fibres are united to the Bones, by the Veſſels proceeding from the Bones, which Veſſels compoſe what in Land-Animals is called the *Perioſteum.*

In order to give a clear Notion of what I mean, when I ſpeak of the Muſcles of a Cod-fiſh, I have here cauſed two of thoſe Muſcles to be delineated, lying cloſe together, as they are united to one another and ſeparated from the other Muſcles, *A*, *B*, *C*, *D*, the Part deſigned *Fig.* 12.

by

by *A*, *B*, *C*, having been covered with the Skin near the Head of the Fiſh. And it is my Opinion, that the Body of the Cod-fiſh, from Head to Tail, conſiſts of a continued *Series* of ſuch Muſcles.

I have likewiſe cauſed a ſingle Muſcle of the Fiſh to be repreſented by *E*, *F*, *G*, *H*, where *E*, *H*, *G*, ſhews the Thickneſs of the Muſcle; and it's thin Edge, which is no thicker than the Edge of a Knife, is marked by *E*, *F*, *G*. *Fig.* 13.

When theſe Muſcles had lain ſeveral days upon a Paper, yet they were not dried ſo hard, but that I could ſplit them into thin Shivers, one of which is deſigned between the Letters *I* and *K*, in order to ſhew the oblique Courſe of the Fibres, which are repreſented by ſmall Lines. *Fig.* 14.

I now turned my Thoughts to the River-fiſh, and particularly to the Pearch; and, as I imagined that an old Pearch had no greater number of Muſcular Fibres than a young one, but only that the Fibres encreaſed in bigneſs during the Growth of the Fiſh, and that the larger theſe Fibres were, the more plain and diſtinct muſt be the ſmall Veſſels, of which the Fibres were compoſed; I procured one weighing three Pounds and an half, and ſeventeen Inches and an half in length *Delft* Meaſure, which is the ſame with the *Rhinland*.

I cut off four pieces from this Fiſh, two from the Back near the Head, and two others from the Belly in the thick part of the Fiſh, with deſign to make my Obſervations upon them the next Day.

Accordingly, at that time, I took a view of the Muſcular Fibres both in length and breadth, and found that the Fibres of this great Pearch were not ſo thick as thoſe of the Cod-fiſh. Upon cutting them through lengthwiſe, I ſaw the Apertures of the ſmall Veſſels in ſo great a number, as I could hardly have believed, if I had not ſeen them. I next cut ſome of the Fibres tranſverſly, and plainly found them thinner in this Pearch, than in a middling Cod-fiſh, and ſaw the ſmall Veſſels, that compoſe the greateſt part of the Bulk of the Fibre, lying as cloſe together, as ever I ſaw them in any kind of Fiſh or Fleſh.

To give a better Notion of theſe Muſcular Fibres, and of the great number of ſmall Veſſels, of which they are chiefly compoſed; I had, ſome Weeks before, placed ſome of them cut tranſverſly in pieces before a Microſcope, with deſign to have them drawn by my Painter, but had been obliged to defer it, by reaſon of the great Severity of the Weather. Theſe had been a little moiſtened before they were placed upon the Glaſs, in order to make them ſtick to it the better; and I have cauſed a ſmall portion of theſe Muſcular Fibres of the Fiſh, cut through tranſverſly, after they were grown dry, and in their ſhrinking had been torn off from the ſmall Veſſels, that encompaſſed them, to be repreſented, as at *L*, *M*, *N*, *O*. The openings of the ſmall Veſſels in theſe Fibres were diſtinctly to be ſeen, but appeared in ſuch *Fig.* 15.

great

great Numbers, and were ſo exceedingly ſmall, that it was impoſſible for the Painter to repreſent them any otherwiſe than by Points.

In this Figure are repreſented what we call the Membranes, but which indeed are nothing elſe but a *Congeries* of ſmall Veſſels, which not only ſurround the Fibres, but enter into their very Subſtance. Theſe, in the drying and ſhrinking of the Object upon the Plate, had been torn off from the Fibres, as may be ſeen at *P*, *P*, *P*.

When this was done, I put a ſmall drop of Water, about the ſize of a Pin's head, on this ſmall Portion of Fibres, into which it immediately inſinuated and ſwelled them to the ſame bigneſs, as when they were firſt laid upon the Plate: After which, I deſired the Painter to draw them, as they then appeared to him, but to omit repreſenting the ſmall Veſſels, and only to define the Circumference of every
Fig. 16. Fibre, which he did, as appears at *Q*, *R*, *S*, *T*.

I then clove a grain of Millet through the middle, and placing one half of it upon the Glaſs, beſide the Portion of Fibres repreſented in Fig. 15. I deſired the Painter to obſerve the difference in bigneſs between the half grain of Millet-ſeed, and that portion of Fibres; who told me, that the half grain appeared larger than the portion of Fibres, and ſo ſaid likewiſe a ſecond Perſon that viewed them. By which one may eaſily imagine, in how ſmall a ſpace that number of Fibres is comprehended, each of which conſiſts of ſo many Veſſels.
Fig. 17. I cauſed the Painter to repreſent the half grain of Millet at Fig. 17.

I likewiſe made my Obſervations upon the Muſcular Fibres of a Pike, a Roach, a Schar, and Flounder, in each of which I found the Fibres to be compoſed of ſmall Veſſels, like thoſe of a Cod and Pearch.

I took the largeſt dried Sprat I could light on, which was a little more than five Inches in length, and I found that the Fibres of the Sprat were but little thinner than thoſe of the large Pearch ſpoken of before, and that the Veſſels of which the Fibres were compoſed, were nearly as numerous as in the Fibres of the Pearch.

From theſe Obſervations ſome Perſons may be apt to conclude, that the Muſcular Fibres of Land Animals are of the ſame thickneſs with thoſe of Fiſh. But for the ſatisfaction of thoſe, who have not ſeen the Objects here ſpoken of, I have cauſed a ſmall portion of the Muſcular Fibres of a large Ox to be delineated, as they appeared through the ſame Microſcope with the former, to ſhew the thickneſs of the dried Fibres, and the Veſſels that compoſe them, *X*, *Y*, *Z*.
Fig. 18. I deſired the Painter to tell me, how many Veſſels he could ſee in the tranſverſe Section of one of theſe Fibres; who, after ſome pauſe, replied, That he counted five and twenty Veſſels in one Fibre.

Some time after this, I had a ſmall Smelt brought me, of the length of about two Joints of my Finger; and cutting ſome of it's Muſcular Fibres tranſverſly, I placed them before a Microſcope, and ſaw not only that theſe Fibres were twice as thick as thoſe of an Ox,

Fig. 12.

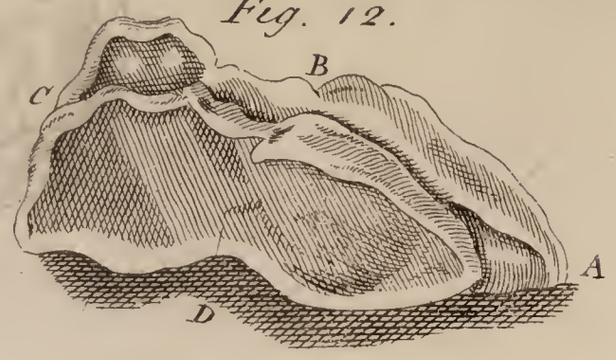


Fig. 13.

Fig. 14.

Fig. 15.

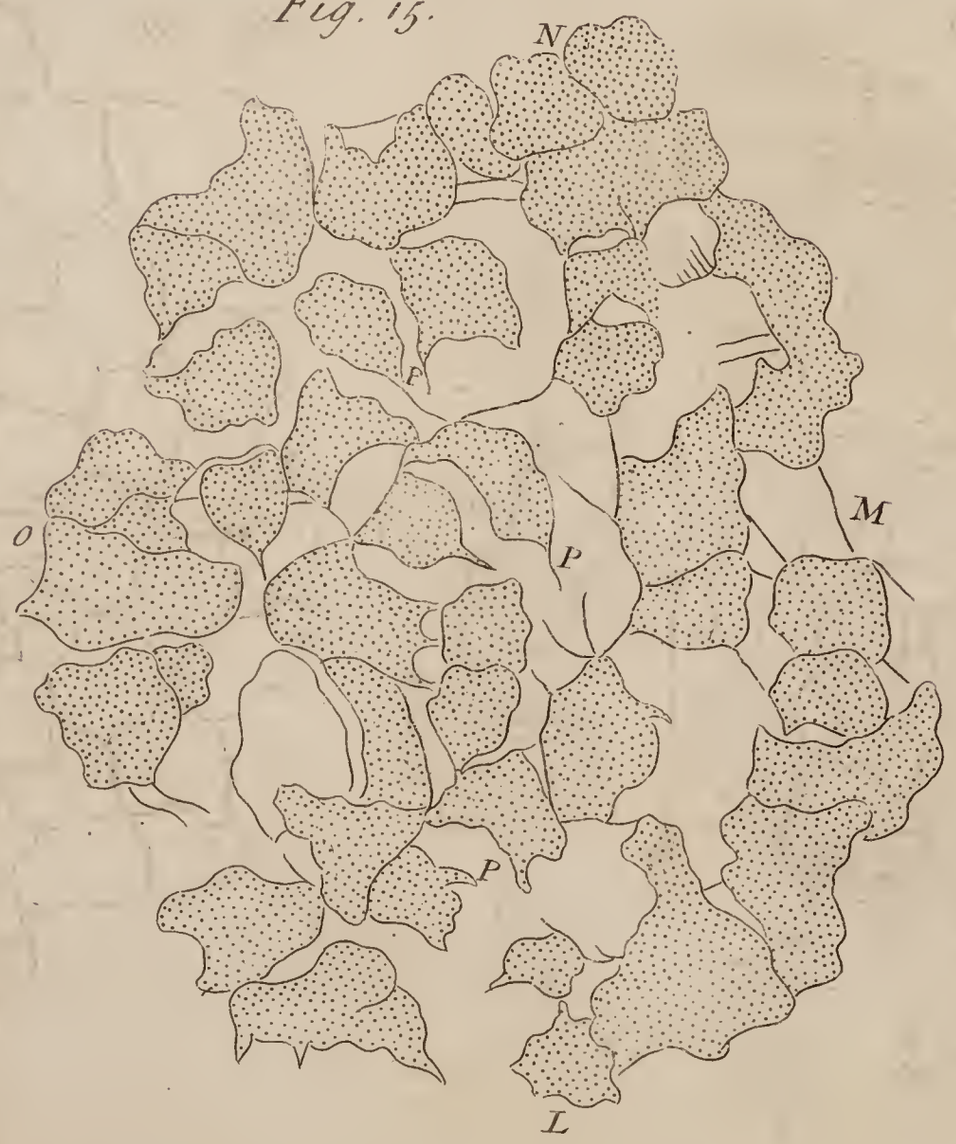


Fig. 16.

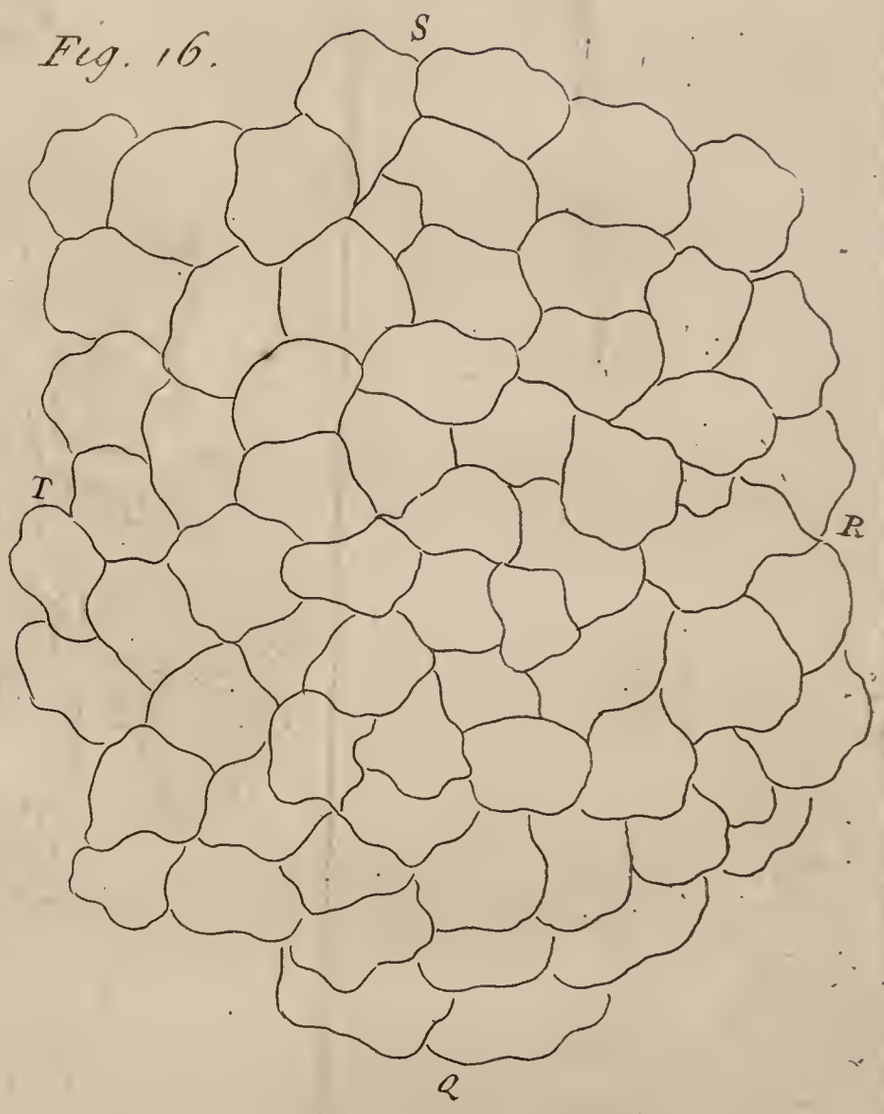


Fig. 17.

Fig. 18.

but likewiſe that they were provided with as great a number of Veſſels as the Fibres of other Fiſh.

Upon thus obſerving that the Muſcular Fibres of Fiſhes were much larger than thoſe of Beaſts, I ſet my ſelf to conſider, for what Reaſons the great Creator of the Univerſe had made this Diſproportion between them. All the Satisfaction I could meet with, in my Thoughts upon this Subject, was, that as the Fiſh ſwim in the Water, their muſcular Fibres need exert very little force, to ſupport their Bodies in the Water, becauſe they are very nearly of the ſame ſpecific Gravity with the Element, in which they ſwim. All the force they exert is in their progreſſive Motion, in purſuit of their Food. Whereas, the Muſcular Fibres of Land-Animals exerciſe a great force, not only in ſupporting and moving their own Bodies, but in carrying Burthens and other Labour they are put to. And we muſt allow, that the ſmaller and finer the Fibres are, to make a Body of any determinate thickneſs, the ſtronger will be the Compoſition, and therefore the Muſcles in the Fleſh muſt be ſtronger than thoſe of Fiſh. But this I leave to better Judgments.

An Oſtrich *diſſected by Mr* John Ranby *Surgeon, F.R.S.* N°. 386. p. 223.

XIII. 1. Having ſeparated the Muſcles of the *Abdomen*, which in this Subject were only two oblique Pair, we obſerved, between their *Tendons*, which were very ſtrong, and the *Peritonæum*, which was exceeding thin, a thick Layer of ſevous Fat, whoſe Office, conſidering the Smallneſs of the *Epiploon*, and the few adipoſe Veſicles of the *Meſentery*, with the Thinneſs of the *Peritonæum*, might probably be to ſupply the Part both of *Epiploon* and *Meſentery* in other Animals, as to lubricate the Inteſtines.

There were, in our Subject, two diſtinct Ventricles, contrary to the Obſervation of the *Royal Academy* at *Paris*. The firſt, and in it's natural Situation, the lower, which the Members of the ſaid Academy, call the Craw, and ſuppoſe to be only a Dilatation of the *Oeſophagus*, was conſiderably larger than the ſecond, and uppermoſt Muſcular One; beſides, that it had ſtrong Muſcular Fibres, both circular and longitudinal: The *Duodenum* comes immediately out of the ſecond Ventricle.

Both Ventricles were diſtended beyond their uſual Form, and filled up with ſo large a Quantity of Food of different kinds, as Stones, Bones, Sticks, Grain, and other Food, that it was almoſt impoſſible for them to perform their Office of Digeſtion, which very likely was one of the chief Cauſes of the Animal's Sickneſs and Death; and, really, the Contents of both ſeemed to have undergone but very little or no Alteration. The *Epiploon* partly covered the firſt Ventricle, but was no Ways proportionable to the ſize of the Animal.

The Spleen was faſtened, by a Membrane, to the right Side of the ſecond Ventricle, and was very ſmall, conſidering the Size of the Animal.

The Glands of the *Meſentery* were hardly viſible, but the Veins and Arteries very conſpicuous.

The *Cæcums*, in our Subject, were near three Foot in Length, the Diameter one Inch eight Lines; they were faſtened to the *Ileum*, and not to the *Colon*, as the Gentlemen of the *Royal Academy* aſſert.

To their Deſcription of the Kidnies, I have nothing to add, except that the two *Ureters* lay upon their Surface, as they do in other Birds, and by their different Branches, coming from all the Parts of the Kidney, of which the ſuperior was very conſpicuous, entered the Kidney about it's Middle, and formed there a very large *Pelvis*.

The Liver was in one Cavity with the Heart, of which it covered near one half; it had no Gall Bladder, and but one *Ductus Bilarius* inſerted into the *Duodenum*, about two Inches below the *Pylorus*, which ſeemed to have an immediate Communication with the *Vena Portæ*, becauſe by blowing into it, this latter was alſo diſtended. The Heart and Liver were ſeparated from the Inteſtines, by a membranous *Diaphragm*.

Both Heart and Liver were ſuſpended by one common *Mediaſtinum*, by the Help of it's ſeveral Membranes, and eight ſtrong Muſcles on each Side, ariſing from the upper Part of the Ribs, going from thence over the Lungs, and ending in a very ſtrong tendinous Membrane, which is inſerted into the *Spina Dorſi*.

The Liquor contained in the *Pericardium*, was ſmall in Quantity, and perfectly tranſparent.

The Lungs lay under the *Diaphragm* and it's Muſcles, in a deep Cavity, formed by the five true Ribs. They were pretty thick about the middle, and exceeding thin and ſharp towards the Extremities

In viewing the Eye external, it ſomewhat reſembled the Human Eye, except that it was leſs convex, with a free and moveable upper Eye-lid, with Eye-laſhes, as moſt Terreſtial Animals have, beſides a *Tunica Nictitans*, as in other Birds. Beſides the ſeven Muſcles of the Eye, as they are in Brutes, it had two more, one ariſing from the fore-part of the *Sclerotica*, which ſoon formed a ſmall *Tendon*, obliquely ſurrounding the Optic Nerve, and then joined to another Muſcle, which ariſes oppoſite to the former, from which the *Tendon* continues it's Way, and is inſerted in the *Tunica Nictitans*. The *Aqueous* Humour we found in greater Quantity, than is common. The *Cryſtalline* was of an uniform Subſtance, but leſs convex on the inſide, than without. The *Vitreous* was ſmall in Quantity, conſidering the Largeneſs of the Eye; the *Choroides* was intirely black, without that Variety of Colours at it's Bottom, which is common to moſt Brutes. The fore-part of the *Sclerotica*, where it is annexed to the *Cornea*, was bony, conſiſting of 15 bony Scales joined one to another, ſo as to make one circular Bone round the *Cornea*.

Fig. 19. ſhews the upper Part of the *Thorax*, the *Sternum* being removed, with the Heart and Liver and neighbouring Parts, in their natural Situation. A A the membranous *Diaphragm*, in which are ob-

served several distinct Cavities. *a a a.* The Ligament that suspends the *Diaphragm.* *b b.* The Ribs. B. The Heart. C C. The two Lobes of the Liver immediately above the Heart. *c c.* The Brachial Artery. *d.* The Vein. *e e. Vena Cava.* *f.* A *Gland*, on the Brachial Artery. g g. Part of the *Aspera Arteria.* *h h.* Part of the *Oesophagus.* *i i.* Two Muscles arising from the *Sternum*, and inserted into the *Aspera Arteria.* *Fig.* 19.

Fig. 20. The inferior Part of the *Thorax*, the Heart and Liver being removed. A A A. The lower Part of the *Diaphragm*, immediately covering the Lungs. B B, *&c.* Eight strong fleshy Muscles arising from the Ribs, and inserted into the *Diaphragm*, forming a Cavity for the Heart and Liver. *c c* &c. the Ribs D. the descending Trunk of the *Aorta.* E E. The left Lobe of the Lungs freed from the *Diaphragm.* F. Part of the *Aspera Arteria.* *Fig.* 20.

Fig. 21. Part of the Globe of the Eye. *a.* The *Cornea.* *b b.* The Ciliary Ligament. *c c c.* The fore-part of the *Sclerotica*, composed of 15 bony Scales. *Fig.* 21.

Fig. 22. The back Part of the Globe. *a a a.* The back Part of the *Sclerotica.* *b b b*, *&c.* The seven Muscles. *c c c.* The eighth and ninth; the *Tendon* of which (*d d*) goes round the Optic Nerve, *f*, and is inserted into the *Tunica Nictitans.* *e e. Membrana Nictitans.* *Fig.* 22.

Fig. 23. The Kidnies with their Vessels. A A. The Kidnies. B B. *Aorta descendens.* C C. *Vena Cava.* D D. The Emulgent Arteries. E E The Emulgent Vein with it's Ramifications. F F. The Ureters. G. The Union of the superior and inferior Ureter. *Fig.* 23,

2. To the preceding Account I beg Leave to add two or three Observations which escaped my Notice in my former Dissection. And *First*, the Eye, the Figure of which, when taken out of the Orbit, I think particular, being almost triangular, with some little Variation in the bony Scales. The Contents of the Stomach were of such a Kind, that they were hardly capable (without very great Alteration) of passing the lower Orifice, which is very small. *Material Observations upon dissecting an* Ostrich, *by the same.* N°. 413. p. 275.

The Diameter of the *Duodenum* much smaller than any of the Intestines, and free from *Valves*, as are the *Jejunum* and *Ileum*, except the latter, which has a few *Valves*, as it approaches near the *Colon.* The *Colon* was uneven, with very regular Cells: These Cells were formed by *Valves*, which were on the Inside, and transversly situated each making more than half a Circle.

The Parts in other Respects answer the Description given by the several curious Gentlemen that have dissected this Animal.

3. Dr *Brown* has so well described the Parts of the *Ostrich* which he dissected [*Philos. Collect.* N°. 5.] that I think, there is not much to be added. But he affirms it has no *Epiglottis*; whereas in this Subject that Cartilage was plainly visible; and indeed, the *Rimula* appeared too open not to require one. The *Os Hyoïdes* is three Inches long from the Basis; the *Musculi Directores Asperæ Arteriæ* were very plain, large and strong; the Ring composed of three Cartilages at the Divarication *Observations upon the Dissection of a Male* Ostrich, *by Mr* Geo. Warren, *Surgeon in* Cambridge. N°. 394. p. 113.

tion of the *Aſpera Arteria* very bold; the two Glands on the Carotid Arteries, of the Size of ſmall Eggs. There was nothing in the Lungs or Heart, but what it has in common with other Birds. The two Stomachs, *viz.* the Crop and the Gizzard, were filled with half-digeſted Graſs, in which were ſome Nails, ſome Stones of the bigneſs of Walnuts, and about fourteen or fifteen Pieces of Silver and Copper Money. The firſt Stomach or Crop was exceeding tender, and contained, crammed as it was, between three and four Quarts. The Glands on the top of the Crop were very large and numerous, in the Order deſcribed by Dr *Brown*, and of the Bigneſs of little *Oculi Cancrorum*, and of a watery-brown Colour; which being ſo different from the Colour of the Stomach, that added to the pretty Order they are placed in makes them very remarkable. The Crop lay within the *Thorax*, but ſo that the Gizzard lay higher. The Looſeneſs and Likeneſs to Flannel, of the inner Coat of the Gizzard mentioned by Dr *Brown*, was very remarkable in this Bird; but the Texture in the Muſcular Part of it did not ſeem proportionably ſtrong to that in other Birds, being broader, thinner, and more flaccid. The Guts, as near as I could meaſure them, were about twenty ſix Yards long. The two *Cæcums*, which are about thirty four Inches long each, and have beautiful ſpiral Valves, were Appendages of the very beginning of the *Colon*. The Teſticles lay as in other Fowls, very high, and leſs than Pidgeons Eggs, but longer. I found the Liver to have four Lobes, and thought I had met with a Gall-bladder, but it appeared at laſt to be only the Membrane of the Liver raiſed by ſome Accident from it's inner Subſtance. The Gland under the Stomach, which Dr *Brown* ſuppoſes to be the Spleen, and the *Pancreas* and Kidnies anſwer his Deſcription; and the Ureters were, as he ſays, firm, ſtrong, white, long, and opening into the *Rectum*. The Eye is ſaid to be exactly like the Human Eye; but is indeed, a perfect Gooſe-Eye for it's Colour, and, I believe, for the reſt of it's Parts, as they are well deſcribed by Mr *Ranby:* It was flatter than the Human Eye, as it is, I believe, in all Birds; and it had that ſimple Look ſo peculiar to the Gooſe. The bony Circle deſcribed by Mr *Ranby*, this Bird has in common with other Fowls both of the Water and Land, with this difference only, that the Ring in Water Fowls conſiſts of fifteen, and in Land Fowls but of fourteen Bones. They are ſo diſpoſed, that one Bone lies over the Ends of two others, then three or four lie over one another, like the Scales of Fiſh; then one Bone lies under the Ends of two others; and then two or three more follow again like the Scales of Fiſh: but unleſs there be a *Luſus Naturæ*, I think Mr *Ranby*'s *Icon* does not expreſs it ſo very juſtly, as I believe it might be done. There was no *Muſculus ſuſpenſorius Oculi* in this Animal, nor do I believe it is to be found among Birds, and indeed there ſeems to be no Reaſon for it.

The Crop was ſo ſtuffed with Graſs, or rather Greens (proper Food for a Gooſe, or one of that Kind) that I do not think the Bird could have

Fig. 21.

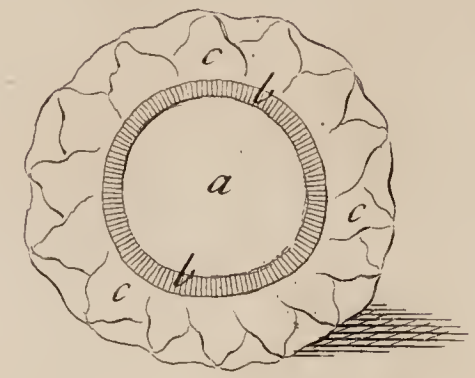


Fig. 19.

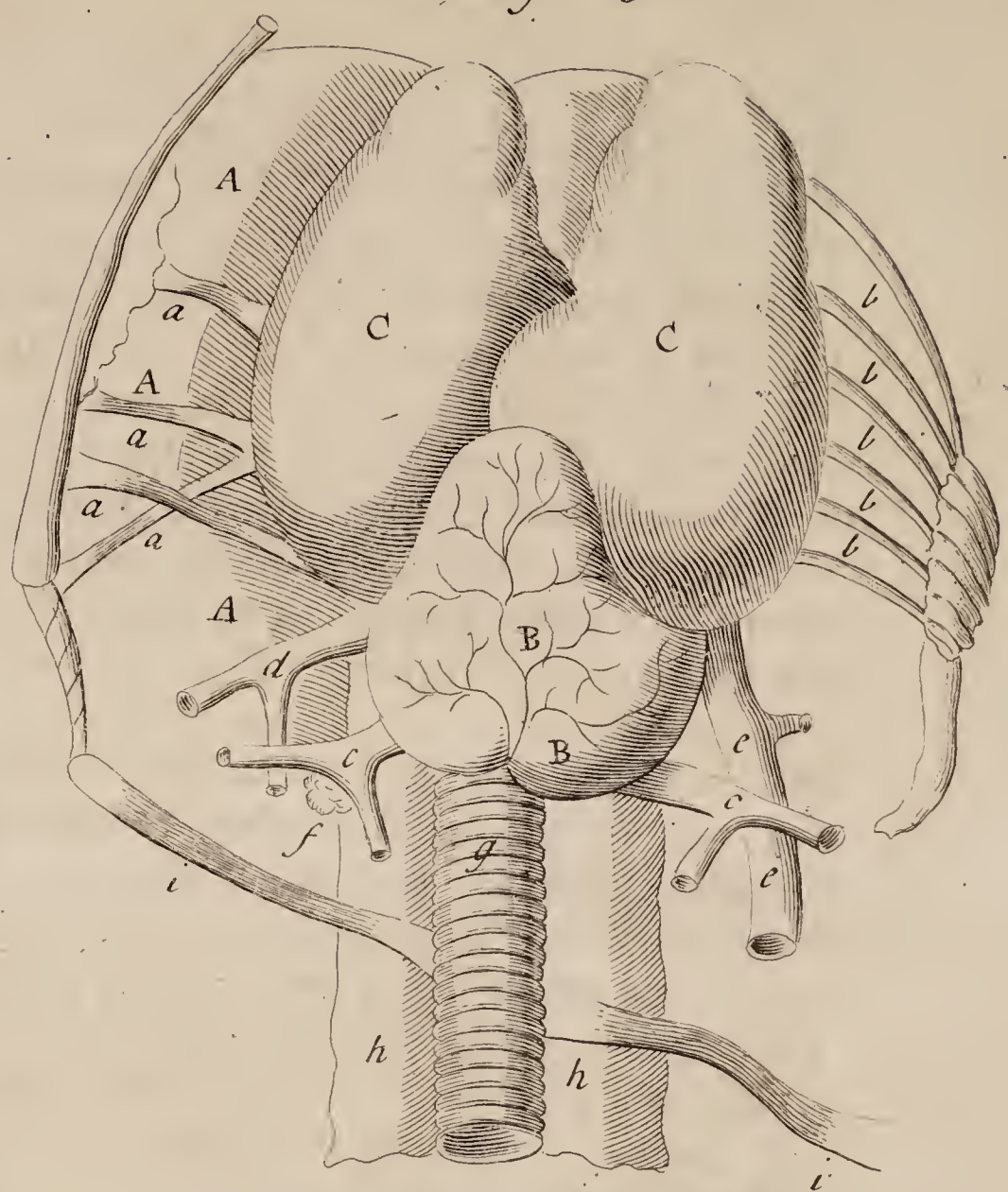


Fig. 20.

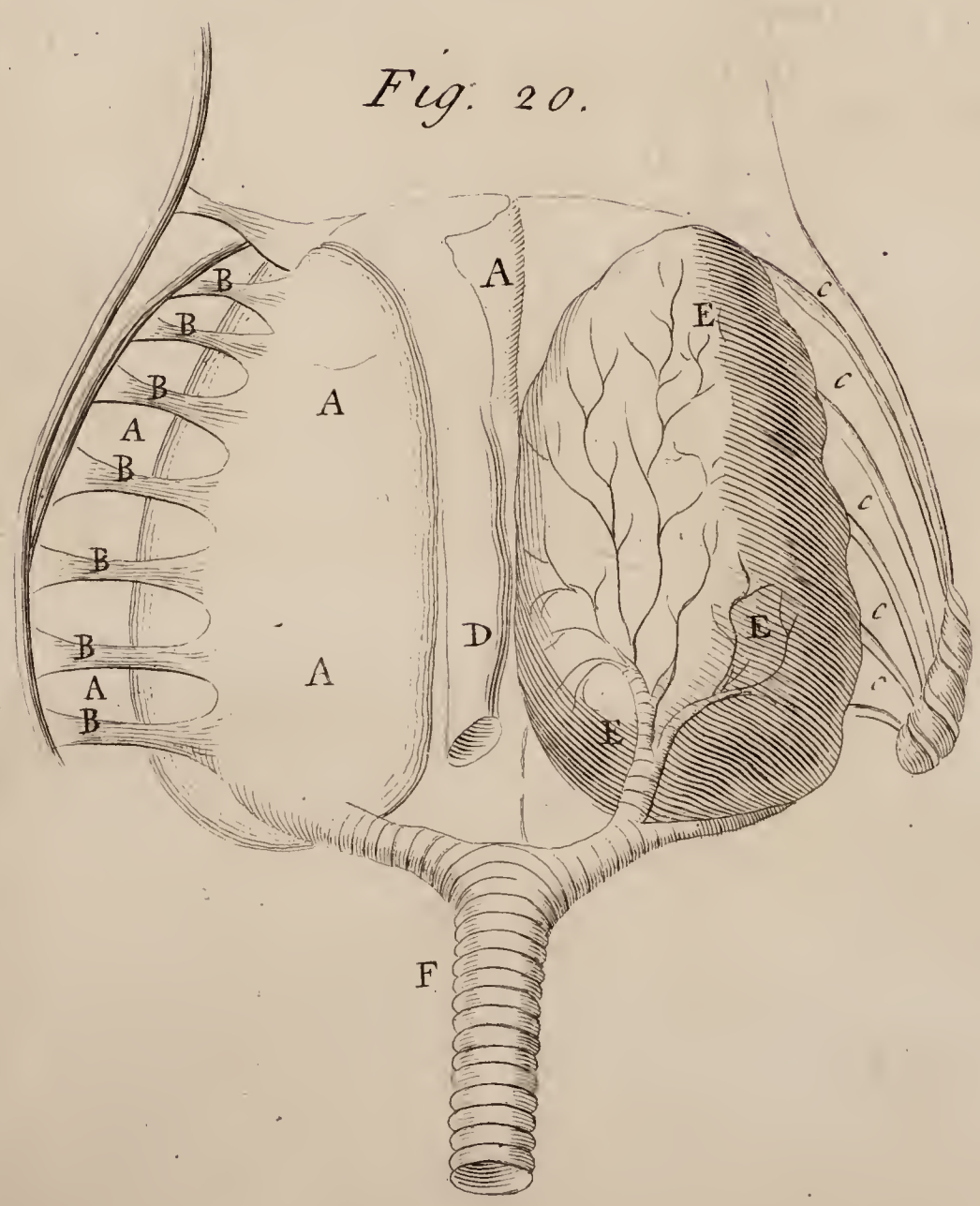
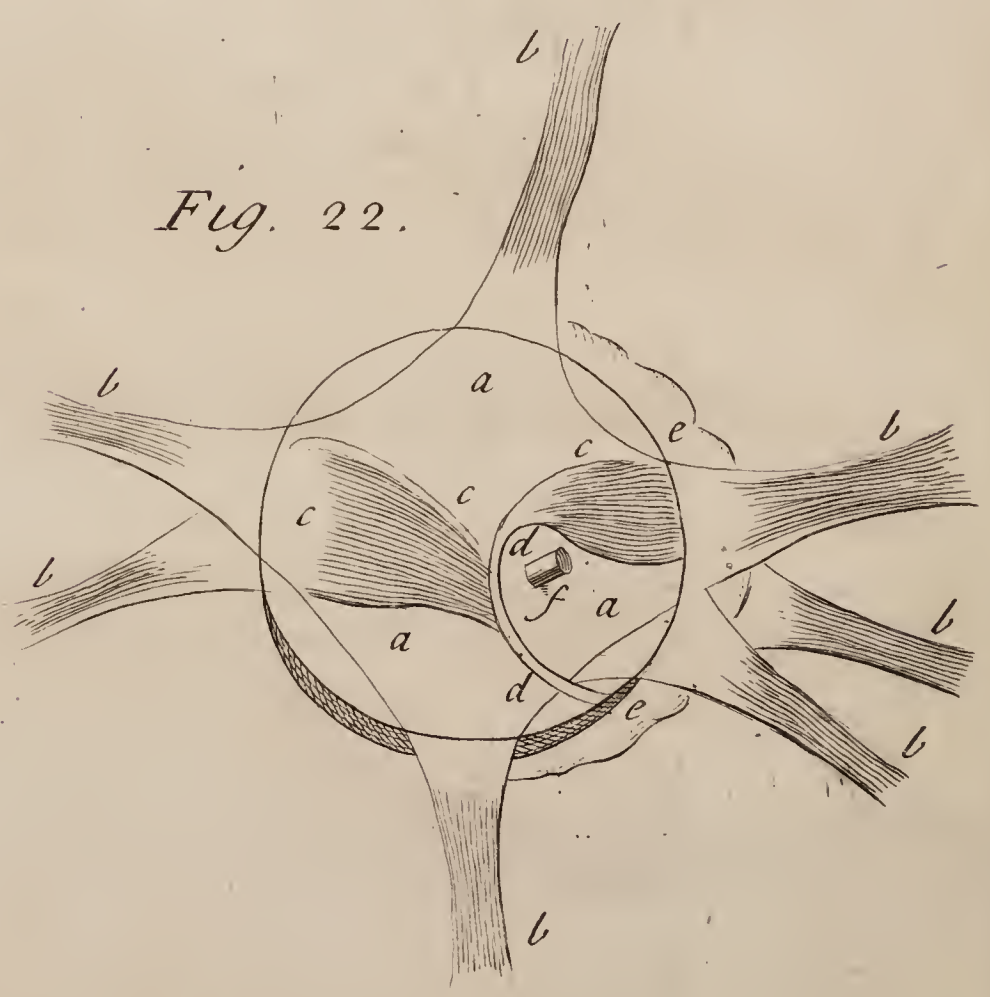


Fig. 22.



have digeſted it all, if there had been no other Reaſon for it's Death. The Gizzard was not ſo ſtuffed as the Crop, and what was therein, ſeemed undigeſted. The Guts contained a thick deep green Juice, even to the *Cloaca*. The Money both of Silver and Copper in the Gizzard was very remarkably worn away; the Edges, in particular, were made round, and the Buſt and Reverſe ſcarce perceptible in ſome Pieces, and quite obliterated in others. The *Ærugo* and *Sulci* in many of the Pieces would make one believe (that beſides the Attrition) there may be a *Menſtruum* in their Gizzards not unfit to diſſolve Metals. Within an Inch of the End of the *Rectum* was the *Cloaca* or Expanſion of that great Gut, which was thinner than the other Part of the Gut, in proportion to it's Expanſion, and would hold above half a Pint. The End of the *Rectum* (from the *Cloaca*) opened into a Cavity big enough to hold my two Fiſts; and for want of another Name, I will call it the *Receptaculum Penis*, becauſe therein the *Penis* was always lodged when flaccid. I know, that Part is called by Dr *Brown*, *a kind of Præpuce*; but upon Diſſection, it appeared plain enough to me to be a very ſtrong Muſcle compoſed of circular Fibres, and to be deſigned for a Sphincter of that Part wherein the *Penis* was to be lodged, and to be a Sphincter of the *Rectum* too; round which I traced the ſame Muſcle above an Inch; and this being but one Muſcle, muſt be the reaſon that the *Penis* always came out ſome Inches when it muted, as they told me it did. The *Penis* flaccid as it is, is five Inches and an half long from the Skin of that *Receptaculum*, and, as Dr *Harvey* ſays, not unlike a Hart's Tongue. I do not find a Cartilage in it, as Dr *Brown* ſuggeſts; but at it's Origination it is ſo hard, that, I believe, if the Bird had lived ſome Years, it poſſibly might have become cartilaginous. There are two Bodies that are joined to the *Crura Penis*, which I ſuſpected to be the *Veſiculæ ſeminales*; and the more, becauſe there are two Veſſels enter them, which I believe to be the *Vaſa Deferentia*; but of this I am not certain: For though I found *Semen* in the *Urethra*, I have not been able to trace a Paſſage from theſe ſuppoſed *Veſiculæ ſeminales*, or thoſe Veſſels, or any other Part into the *Urethra*. I call it *Urethra*, becauſe there is no other Term fixed that I know of, though the Urine do not paſs that way; but as in other Birds, is mixed with the groſſer Excrements in the *Cloaca*. The *Urethra* then, is only a *Sulcus*, or Gutter, from one end of the *Penis* to the other; which *Sulcus*, as the *Penis* lies flaccid in the *Receptaculum*, as I venture to call it, lies on one ſide; but upon Erection, the *Penis* turns towards the Belly, and the *Sulcus* is then at the Top, and lies conveniently enough for Conveyance of the *Semen*. If thoſe two Bodies are not the *Veſiculæ ſeminales*, they muſt be Elongations of the *Crura Penis*; but I think, they are of much too looſe a Contexture to ſerve that purpoſe. Whether the *Vena Cava*, dividing into two Branches to go into the Kidnies, and uniting again when it comes out, is ſingular to this Bird, or is in common with Geeſe and other Water-Fowl, I do not yet know; but

ſo it was in the Oſtrich. I will ſuppoſe it to be in common, till I have examined further, ſince I know, that the *Cæcums* of the Oſtrich, which are ſo much taken notice of, are no more than what it has in common with other Fowls; and that a Chicken has two, as large, and as long in proportion as the Oſtrich: I had too little time allowed me, and the Oſtrich had too much Fat for me to make a more accurate Diſſection. The *Omentum* upon the Stomachs and Guts was ſix Inches thick at the Top, and decreaſing gradually, was near two Inches thick in the Vent, and was divided into two Parts in the Middle from the Top to the Bottom. What I found, that I was ſure was in common with other Fowls, I have not taken much notice of, unleſs repreſented by others differently from what I found, or ſo as if peculiar to this Bird. I forgot to take notice, that the Baſis of the *Os Hyoïdes* is
Fig. 24. ſhaped, as in *Fig.* 24, and the round Part of the Top is lodged in a proper Cavity in the top of the Tongue. Partly under the Baſis of the *Os Hyoïdes*, lies a Cartilage in the Front and very beginning of the *Aſpera Arteria*, which is not unlike the *Thyroïdes*; but other Cartilages in that Part it has none, but what forms the *Rimula*. The firſt 28 Cartilages of the *Aſpera Arteria* are not annular, the reſt (being about 226) are entirely annular; but as ſoon as it divaricates to go into the Lungs, they are not ſo again.

An Account of a Stone taken out of a Horſe, at Boſton *in* New England, *in* 1724. *By the Hon.* Paul Dudley, *Eſq*; *F. R. S.* No. 398. p. 261.

XIV. The Owner of the Horſe never perceived that he ailed any thing, till within a few Days before he died, and then ſuſpected that he might be troubled with the Gravel or Stone, by the great Pain the Horſe ſeemed to be in, when he ſtaled or dunged; for he would groan and ſweat prodigiouſly. Upon which he got a Farrier, who applied ſomething to break the Stone; but in a very ſhort time the Horſe died, and the Farrier being ſomewhat curious, was reſolved to open him, and in the great Paunch, found a Stone of $5\frac{1}{2}$ Pounds Weight, almoſt as round as a Globe; for it meaſured 17 Inches round one way, and $17\frac{3}{4}$ Inches the other. The Grit was like your *Newcaſtle* Grindſtone; but was worn ſmooth in the Horſe's Stomach, the Colour ſomewhat like that of a Nutmeg, but more of the ordinary Millſtone. I could not perſwade the Owner to break it, but by the likeneſs of it, conſidering it's Bulk, I am apt to think it might be porous within. How long this Stone was generating, or what produced it, is altogether uncertain. The Owner of it was a common Carter to a Griſt-Mill; and ſome have thought that the Horſe might either in his Provender out of the Mill, or by licking of Mill-Stones that ſometimes ſtand up by the ſide of the Mill, get the firſt Seed of this Stone into his Stomach. The Weight of the Stone at length made a Fracture in the Paunch, which proved his Death: For before the Breach, and while the Stone rolled in his Stomach, he was very well.

The largeſt Stone found in any Animal that the *Philoſophical Tranſactions* give an Account of weighed but four Pounds four Ounces.

XV. In

Of the Stomachs of Oxen, by Charles Price, *Esq*; N°. 404. p. 532.

XV. In the Stomach of the Cow I find two Things well worth obſerving: The firſt is, that the *Villi* compoſing the villous Coat (which are in Man ſo very ſmall as to be ſcarce viſible when examined ſeparately) are in this Animal ſo very large, as to allow an exact Scrutiny into their Structure. Each Villus is formed by a Duplicature of the internal *Lamina* of the vaſcular Coat; from which it receives three Blood Veſſels, as in *Fig.* 25. which repreſents one of the *Villi* of the Stomach of an Ox magnified. Whether the two Side-veſſels are Arteries, and the Middle-veſſel a Vein; and whether thoſe ſmall Branches ariſing from the Side-veſſels are ſecretory Ducts carrying a Fluid from thoſe Arteries into the Cavity of the Stomach, making a kind of *Rivus* perpetually running through the *Ductus Alimentalis*, I muſt leave others to judge. *Fig.* 25.

The other Thing remarkable in the Stomachs of theſe large Animals is, that their internal Surface is covered by a Production of the Cuticle, which deſcends from the Lips quite through the alimentary Paſſage. I am induced to believe, that the Cuticle is continued thro' the Inteſtines as well in Man, as in large Animals; though it's exceeding Fineneſs may make it leſs obſervable.

I have ſent you a Piece of the firſt Stomach of an Ox, in which the Veſſels running in the *Villi* are filled with Wax, and the Cuticle raiſed in Part; by which the above Particulars are ſufficiently proved.

An Account of a Pair of very extraordinary large Horns. By Sir Hans Sloane. Bart. N°. 397. p. 222.

XVI. Many Years ſince, Mr *Doyly* found a pair of extraordinary large and ſtrangely ſhaped Horns in a Cellar, or Warehouſe, at *Wapping*, where they had ſuffered much by Worms and otherwiſe, being eaten pretty deep on their Surfaces, in many Places. They had lain there ſo long, that when he bought them, no Body could inform him, either of the Country whence they came, or when, or how they had been lodged there. They reſembled in ſeveral things the Horns of Goats, which made many People think, that they had belonged to an Animal of that kind, in all likelihood as large as the *Mouſe-Deer*, in *America* is of it's kind. The Royal Society being informed of this matter, Mr. *Hunt*, their Operator at that time, made a deſign of them, on which Dr *Hook* read a Lecture at a Meeting of the Society at *Greſham-College*. This Lecture and the Deſign, are, I think, loſt; but I remember, that he ſuſpected them to be the Horns of the *Sukotyro*, as the *Chineſe* call it, or *Sucotario*, a very large and odd-ſhaped Beaſt, mentioned and figured by *Nieuhoff* in his Voyages and Travels to the *Eaſt Indies* (*a*) where he gives the following Deſcription of it: *It is of the Bigneſs of a large Ox, with a Snout like a Hog, two long rough Ears, and a thick buſhy Tail. The Eyes are placed upright in the Head, quite different from other Beaſts; on the ſide of the Head next to the Eyes ſtand two long Horns, or rather Teeth, not quite ſo thick, as thoſe of the Elephant. It feeds upon Herbage, and is but ſeldom taken.* Many People thereupon went to ſee them at Mr *Doyly*'s, who afterwards made me a Preſent of them.

(*a*) *Page* 360. *of the Engliſh Edition.*

They

They are both almoſt ſtreight for a conſiderable length, and then turning crooked, they run on tapering towards a ſmall and pretty ſharp end. They are not round, but compreſſed and flattiſh, and have large tranſverſe *Sulci*, or Furrows on their Surfaces, waved or undulated on their under parts. They differ ſome ſmall matter in
Fig. 26. largeneſs. Meaſuring one from the great end, or *Baſis*, A B, where it was fixed to the Head, along the outward Circumference, I found the length A C D to be ſix Feet, ſix Inches and a half, the length by the Line B D was four Feet 5 $\frac{1}{6}$ Inches, the Diameter of the *Baſis* A B was 6 $\frac{3}{4}$ Inches, and it's Circumference one Foot five Inches. This weighed 21 Pounds, 10 Ounces, and contained in the hollow part
Fig. 27. exactly five Quarts of Water. In the other, the length of the outward Circumference A C D was ſix Feet four Inches, the Line B D four Feet ſeven Inches, the Diameter of the *Baſis* ſeven Inches, and it's Circumference one Foot ſix Inches. This weighed 21 Pounds 13 $\frac{1}{2}$ Ounces, and contained in the hollow part 4 Quarts and a Pint, but would have held more, if it had not been very much broken at the large End.

The Commander of an *Eaſt-India* Merchant Ship told me, that he had ſeen ſuch in the *Indies* on a large *Bufalo*'s Head. I am inclined to think, that they muſt belong to a very large ſort of Bulls or Cows, which are Natives of *Æthiopia*, and other of the midland Parts of *Africa*, and are mentioned by many of the Ancients, perhaps not without ſome fabulous Additions, though, which is ſtrange, very few of the Modern Writers take any notice of them.

Agatharchides, a *Cnidian* who flouriſhed about the CLth *Olympiad*, near 200 Years before Chriſt, is the firſt among the Ancients, who mentions and deſcribes this large and voracious Bull; and it will appear by what follows, that moſt of the ſubſequent Writers have copied him. His Deſcription of this Animal, in ſome Remains of his Treatiſe of the Red Sea, which are extant in *Photius*'s *Bibliotheca*, (*b*) and were from thence printed in the *Geographiæ veteris Scriptores Græci minores*, publiſhed by Dr *Hudſon*, is, according to the Tranſlation of *Laurentius Rhodomannus*, as follows, *De Tauro Carnivoro. Omnium, quæ adhuc commemoravi, immaniſſimum & maximè indomitum eſt Taurorum genus, quod carnes vorat, magnitudine craſſius domeſticis & pernicitate antecellens, inſigniter rufum. Os ei ad aures uſque deductum Viſus glauco colore magis rutilat quam Leoni. Cornua alias non ſecus atque aures movet, ſed in pugna ut firmo tenore conſiſtant, facit. Ordo pilorum inverſus, contra quam aliis animantibus. Beſtias etiam validiſſimas aggreditur, & cæteras omnes venatur, maximéque greges incolarum infeſtos reddit maleficio. Solum eſt lancea & arcu invulnerabile, quod in cauſa eſt, ut nemo id ſubigere, (quamvis multi id tentarint,) valuerit. Ideò rectè putatur, etiam à Troglodytis, fortitudine leonis, & velocitate equi, & robore Tauri præditum, ferróque cedere*

(*b*) P. 1364. Cap. XXXIX.

neſcium

Fig. 23.

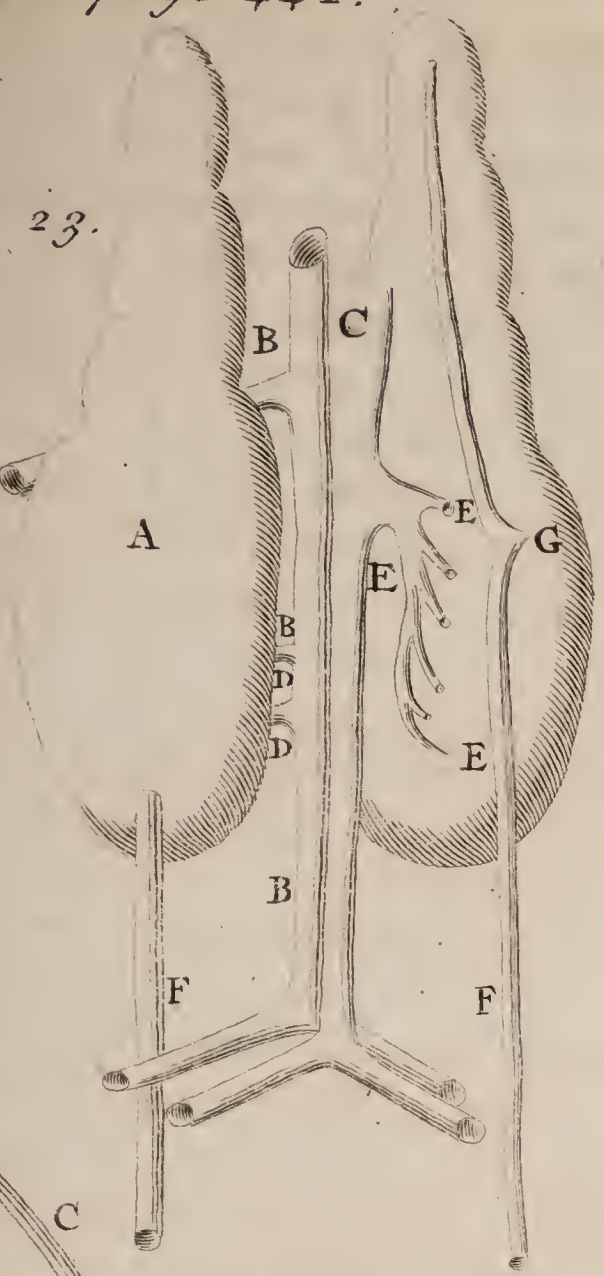
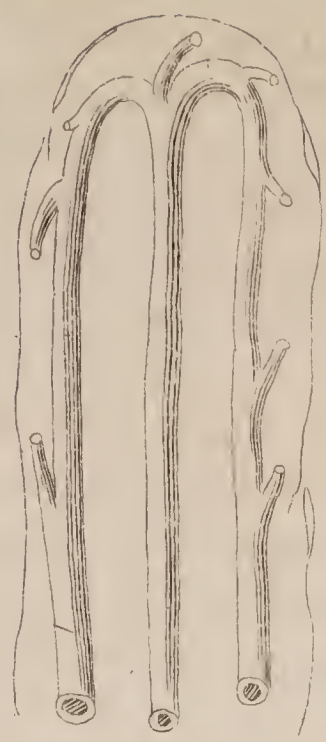


Fig. 24.

Fig. 25.



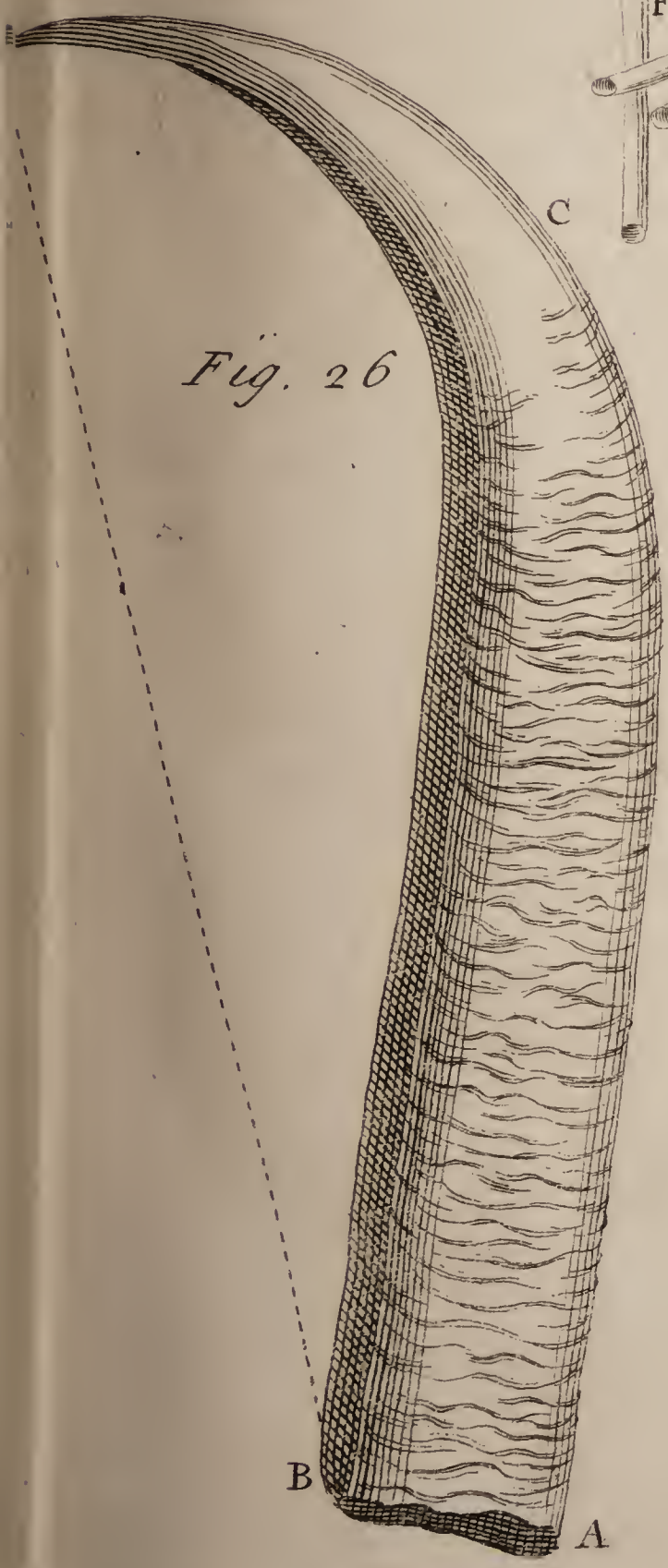


Fig. 26

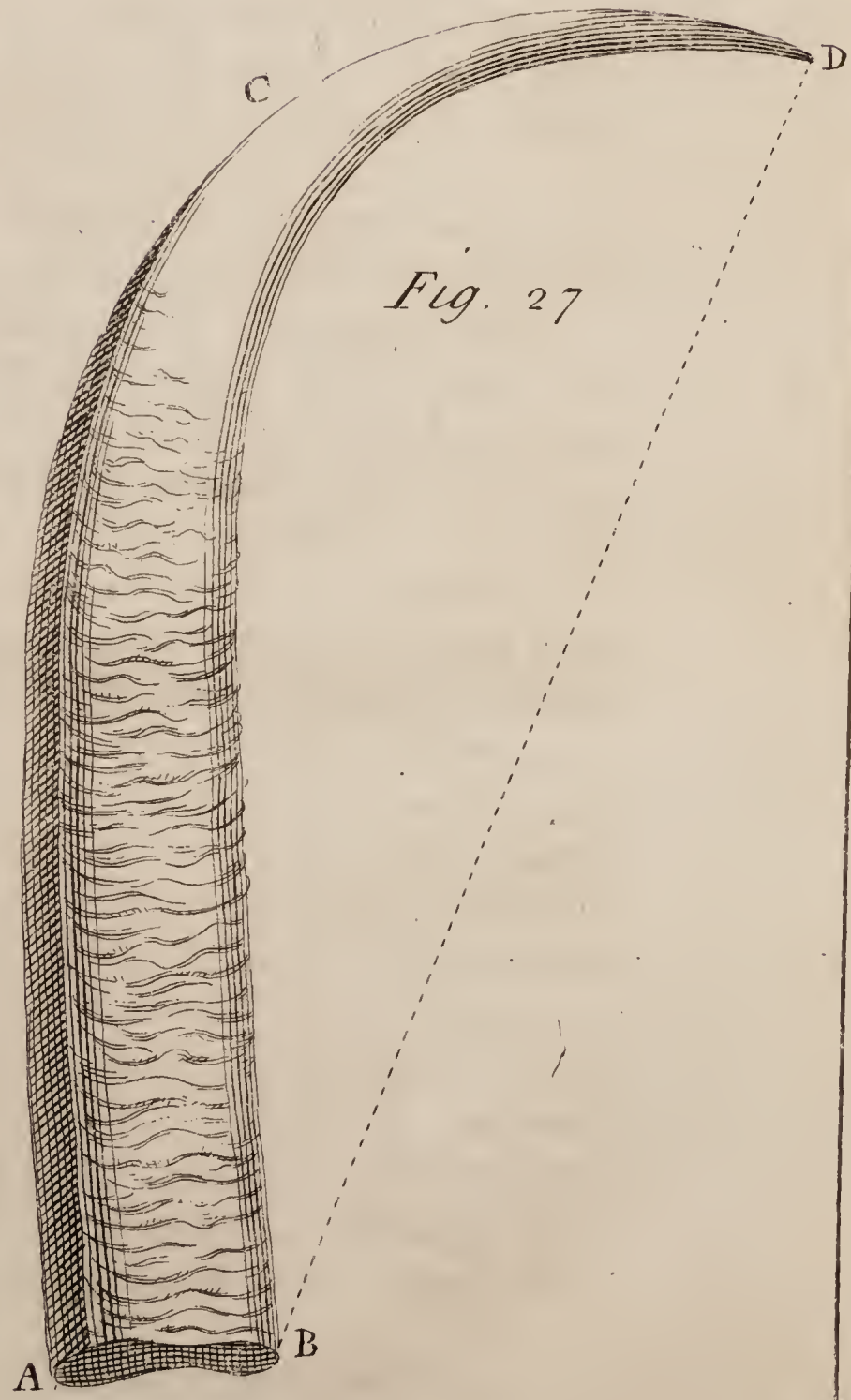


Fig. 27

neſcium. *Diodorus Siculus* (*Biblioth. Lib.* III.) hath barely, and almoſt Word for Word, tranſcribed *Agatharchides*, and hath added only the following Particulars; that the Eyes of this Animal are ſhining at Night; that after it hath killed other Beaſts, it devours them, and that, in it's Attacks upon Flocks of Cattle, it is not to be terrified, either by the Strength of the Shepherds, or the great Number of Dogs. The following ſhort Paſſage relating to this ſame Animal is taken out of *Strabo* (*c*). *Sunt & ibidem* (in Arabia) *tauri feri, ac qui carnem edant, noſtros & magnitudine & celeritate longè exſuperantes, colore ruffo.* Pliny, *Hiſtor. Nat.* Lib. VIII. Ch. XXI. ſeems likewiſe to have copied *Agatharchides:* His Words are, *Sed atrociſſimos habet* (Æthiopia) *Tauros Silveſtres, majores agreſtibus, velocitate ante omnes, colore fulvos, oculis cæruleis, pilo in contrarium verſo, rictu ad aires dehiſcente juxta cornua mobilia, tergori duritia ſilicis, omne reſpuens vulnus. Feras omnes venantur: Ipſi non aliter, quam foveis capti, feritate ſemper intereunt.* In the XLVth Chapter of the ſaid 8*th* Book of *Pliny*'s Natural Hiſtory, he mentions a ſort of *Indian* Oxen. *Boves Indici, quibus Camelorum altitudo traditur, cornua in latitudinem quaternorum pedum.* It is not unlikely, but that theſe *Indian* Oxen are the ſame with the *Æthiopian* ones above deſcribed; eſpecially if we ſuppoſe that the Tranſcribers of *Pliny* have, by Miſtake, written *latitudinem* inſtead of *altitudinem.* *Solinus* (*d*) hath barely copied *Pliny*, with this Difference only, that he calls them *Indicos Tauros*, whereas *Pliny* himſelf hath deſcribed them amongſt the *Æthiopian* Beaſts, which might very well happen, *Æthiopia* being reckoned, by ſome of the Antients, as part of *India.* The Deſcription of *Ælian* (*e*) agrees perfectly with that of *Agatharchides*, of whom, it ſeems, he alſo borrowed it; only he fixes the Size of theſe extraordinary Oxen to twice the Bigneſs of the common *Grecian* Ox. There is another Paſſage in *Ælian* (*f*) which ſeems to relate, both to this large kind of *Æthiopian* Oxen, and the Horns, now in my Poſſeſſion. His Words are, *Ptolomæo ſecundo ex India cornu allatum ferunt, quod tres amphoras caperet: Unde conjicere poſſumus bovem illum, à quo ejuſmodi tantum cornu extitiſſet, maximum fuiſſe.* *Ludolfus*, in his *Hiſtoria Æthiopica* (*g*), ſpeaking of the large *Ethiopian* Oxen, conjectures, that they are the *Taurelephantes*, which *Philoſtorgius*, a *Cappadocian*, ſays (*h*), were brought to *Conſtantinople* in his Time, where he ſaw them. The Words of *Philoſtorgius*, as tranſcribed by *Ludolf*, in his *Commentarius ad Hiſtoriam ſuam Æthiopicam* (*i*), are, *Habet & Terra illa maximos & vaſtiſſimos Elephantas;*

(*c*) *Geogr. Lib.* XVI. *p.* 775. *Edit. Caſaubon.*
(*d*) Polyhiſtoris Cap. LII. p. 58. Edit. Salm.
(*e*) Hiſt. Animal Lib. XVII. c. 4.
(*f*) Hiſt. Animal Lib. III. c. 34.
(*g*) Lib. I. c. 10.
(*h*) Lib. III. c. 11.
(*i*) Pag. 145.

imo & Taurelephantes, ut vocantur, quorum genus quoad cætera omnia bos maximus eſt, corio verò coloreque elephas, & fermè etiam magnitudine.

From all theſe ſeveral Writers it appears, that there is in *Æthiopia* (and probably the midland Parts of *Africa*, where Travellers ſeldom come) a very large Animal of the *bovinum genus*, at leaſt twice as big as our Bulls or Oxen, with Horns proportionably large, but otherwiſe differing from them in many reſpects. And it is confirmed by modern Writers, that there is ſuch an Animal in thoſe Countries, though there is none, I know of, that hath given a Deſcription of it in the leaſt ſatisfactory. *Ludolf*, in his *Hiſtoria Æthiopica* (*k*), ſays, that there are in *Ethiopia*, Bulls of an uncommon Size, twice as large as thoſe in *Hungary* and *Ruſſia*; and that having ſhewn ſome of the largeſt Oxen in *Germany* to *Gregory*, an *Abyſſinian* (from whoſe Writings, and Informations, he collected the Materials for that Work) he ſaid, they were but of a middling Size. The Letters of the Jeſuits frequently mention the largeneſs of theſe Oxen, and the ſaid *Ludolf* cites the following Paſſage out of a Letter of *Alphonſus Mendezius*, Patriarch of *Ethiopia*, dated *June* 1, 1626. *Buoi grandiſſimi, di corna ſmiſuratamente groſſe è lunghe, talmente, che nella corna di ciaſcuno di eſſe potea capire un otre piccolo di vino:* That is, *Very large Oxen, with vaſtly thick and long Horns, one of which would contain a large Uter of Wine.* *F. Bernier*, in his Account of the *Great Mogul*'s Country (*m*), ſays, that among many Preſents, which two *Ethiopian* Embaſſadors ſhould have preſented to *Aurengzeb*, there was a prodigious large Horn of a Bull, full of Civet, which having been meaſured by him, he found the *Baſis*, or large End, to be half a Foot in Diameter. This Horn, as *Bernier* farther obſerves, was brought by the Ambaſſadors to *Dehli*, the place of Reſidence of the *Great Mogul*; but it was not preſented to him, becauſe, being diſtreſſed for Money, they had ſold the Civet out of it, long before they came thither.

Upon the whole, it ſeems to me, that theſe Horns, and likewiſe that mentioned by *Bernier*, are the Horns of a large ſort of Bulls or Cows, in *Ethiopia*, and the inward Parts of *Africa*, which, in all likelihood, is the ſame with that deſcribed by *Agatharchides*, *Pliny*, and thoſe other ancient Writers mentioned above. But I cannot as yet, for want of a more accurate Deſcription, be certain, whether it is the ſame with the *Sukotorio*, or *Sukotyro*, of *Nieuhof* (*n*), though there is a good deal of reaſon to think, that it is. *Geſner* (*o*) ſpeaks of a very large Horn, which was hung by a Chain to a Pillar in the *Minſter*, or Cathedral, of *Strasburgh*, and which is not unlikely to be of the ſame ſort with theſe. He ſays, that being meaſured

(*k*) Lib I. cap. 10.
(*l*) Comment. in Hiſt. Æthiop. pag. 145.
(*m*) Tom. II. pag. 43.
(*n*) Loc. ſupra citato.
(*o*) Icones Animal. Quadrup. Edit. 2d. Tigur. 1560. pag. 34.

along

along the outward Circumference, it was found to be four *Roman* Yards long, and he conjectures it to have been the Horn of a large old *Urus*, which was hung up there, for it's monſtrous Size, perhaps Two or Three hundred Years before his Time. As to theſe, it is very likely, that when the *Engliſh* had a great Commerce at *Ormus*, they were brought thither from ſome neighbouring Country, and afterwards carried over into *England*, by ſome curious Perſon.

Obſervations upon a Fœtus, *and the Parts of Generation of a Sheep. By Mr* Leeuwenhoek, *F. R. S. Tranſlated from the* Dutch, *by Dr* Sprengell, *F. R. S.* No. 373, pag. 151.

XVII. An Ewe, which within two Years time had twice lambed, happened to be covered by a young Ram, about twenty Weeks old. About five Days after this, the Butcher killed the Ewe, and obſerving, that the *Uterus* was four times bigger than ordinary, he brought it, with the *Ovaria*, to me, aſſuring me, that it was not yet quite five Days ſince the young Ram had covered the Sheep, and that there was no other Ram thereabouts.

I endeavoured firſt to penetrate into the Womb from the *Vagina*, with the Point of a ſmall pair of Sciſſars, but I found it ſo cloſe, that I could not enter it, therefore I cut a piece off from the Womb, out of which ran a clear Water, and within it lay the *Fœtus*, with all it's Coverings. I ſpread this upon the backſide of a *China* Tea-Diſh, and finding it ſtill contained more Water, I made a ſmall Inciſion to drain it, and let it dry, that I might obſerve it the better. I could plainly ſee the *Vertebræ* of the Neck and Back, as alſo the Joints of it's ſhort Tail; I thought likewiſe that I ſaw the Eyes. But when it was quite dry, I could not obſerve it's Back-bone ſo well as before, when it was moiſt, though the Painter, who made the Draught, and had ſharper and younger Eyes than mine, ſaw the Bones of the Back very diſtinctly. My Deſign in drying it was to cut it in ſmall Slices, that I might the better obſerve the inner Parts, for it was ſo extremely ſoft and tender when moiſt, that with the leaſt touch it's Parts would be diſordered and confounded. Therefore I cut this *Fœtus* into fifteen Slices and obſerved them with a Microſcope, but could not be very certain what I ſaw. I thought I ſaw the Inteſtines, as alſo the Bladder; and coming to the Breaſt, I fancied that I ſaw the Heart; but I obſerved, with a great deal of Pleaſure, that two Blood-Veſſels lay near together in the Brain, and how they were ſpread into Branches. I had this *Fœtus* drawn as it lay in it's Teguments. A B is the *Fœtus*, *Fig.* 28. and A C D E I K and A F G H L K, the Membranes, wherewith it was involved, in the manner I had ſpread and dried them, wherein the Blood-Veſſels, as much as poſſible, are delineated. Now ſome Perſons might expect, that I ſhould have looked for the Extremities of the Blood-Veſſels; but they have no end, as I have frequently ſaid. Beſides, they become gradually ſo exquiſitely fine, that the Blood, which paſſed through them, can exhibit no red Colour to our Eyes; ſo that there is no tracing them when entering into the Veſſels that return the Blood back to the Heart, except in living Animals, where one may ſee the Blood enter into the returning Veſſels.

Before the Butcher gave me this *Uterus*, he ſqueezed it betwixt his Fingers, and told me that hecould feel nothing in it, and this I believe he had done ſeveral times, by which means he tore off the Veſſels by which the *Fœtus* was faſtened to the *Uterus*; which, I ſuppoſe, was the Occaſion that, upon opening the *Uterus*, the *Fœtus*, with it's Coverings, came ſo eaſily forth.

Fig. 29. I alſo took a Draught of the *Tuba Fallopiana*. At P, is the maginary Orifice, which is thought to ſuck the Egg from the *Ovarium*, according to the old abſurd Notion; at M is ſhewn where the *Tube* increaſes in Bigneſs, and at Q R the fleſhy Subſtance, which I cut away from the *Uterus*. I then had alſo cut off the ſo called *Ovaria*, and the pretended *Ova*, which latter were much too big to paſs upon Conception through the *Tubæ Fallopianæ*. I therefore took the length of the *Fœtus* with a pair of Compaſſes, and meaſured it upon a divided Braſs Rule, and this I did alſo as to it's breadth; I then took the middle Number between theſe, and multiplied it twice by itſelf, to bring it to a Cube Number. I next took the length of the *Axis* of an *Ovum*, as it lay in the *Ovarium* incloſed in it's Membranes, and taking the Cube of that length, and dividing one Cube Number by the other, I found that ſuch an *Ovum* was about ſeven times bigger than the *Fœtus*, notwithſtanding it had near five Days growth. I ſhewed this *Fœtus*, with it's Covertures, to two Phyſicians, and one Surgeon, and I gave them the pretended *Ovaria* in their Hands, and they agreed, that not one *Ovum* was miſſing out of the *Ovaria*. Then I asked them what they thought? how it was poſſible that ſuch an *Ovum* could paſs through the Fallopian Tube? Whereupon the one ſaid, that the *Ovarium* was quite out of doors, and that it was nothing but ſome fleſhy Subſtance. But the other ſaid, that notwithſtanding this, all Animals came from an Egg, and the laſt told me, that he believed that Tube to be neither of a Sheep nor a Lamb; but I ſhewed them that it was from an Ewe which at leaſt had lambed twice, and yet that the Tube was neither thicker nor wider, than the Tube of a Lamb.

After having kept theſe *Ovaria* ſome Days, by which means they were pretty much ſhrunk in the drying, I ordered them to be drawn,
Fig. 30. that the bigneſs of the Eggs might be obſerved. A B C D E is the *Ovarium*, on that ſide of the *Uterus*, in which the *Fœtus* had lain. You muſt obſerve, that the *Uterus* of a Sheep is divided by a Membrane, ſo that the young ones cannot touch one another. D E A is the part where it was faſtened. In this *Ovarium* you may obſerve a round Portuberance, which is beſet with ſeveral others; this great Protuberance is what is called an *Ovum*. This *Ovarium* is not here repreſented ſo large, as it was, when I cut it off from the Parts that it grew to. There was beſides, at one Side of that *Ovarium*, a large round Body, grown to the *Ovarium*, which ſeemed alſo to be an
Fig. 31. *Ovum*, F G, on which there appeared ſeveral other little round Bodies

protuberant from it. Now on the other ſide of the *Uterus*, there was a large fleſhy prominent *Ovum* (as it is called) which might plainly be obſerved without a Microſcope, whoſe Bigneſs is likewiſe drawn, at H I, upon which you may likewiſe obſerve a ſmaller round Body, *Fig.* 32. and out of that again other ſtill ſmaller round Bodies, appear protuberant. After I had quite dried theſe Eggs, repreſented in *Fig.* 30, 31, and 32, I ſtill obſerved more and more of the prominent round Bodies upon them, inſomuch that upon one of them, I told ſixteen round little Bodies, whereof ſome, by loſing all their Moiſture, were ſunk in, and had a Dent in the middle. I cut theſe Eggs, with a very fine ſharp Knife, into thin Slices, and then obſerving them with a Microſcope, I ſaw Blood-Veſſels in them, and alſo other ſorts of Veſſels, which I did not take for Blood-Veſſels, and among the reſt one ſo big, that a Hair of one's Head might enter it, beſides abundance of others exceeding ſmall. After many Obſervations, I could think no otherwiſe, but that the ſo called Eggs conſiſted of nothing but Veſſels, and that the ſuperfluous Moiſture, which was ſent to theſe Eggs, did not circulate (except only what was in the Blood-Veſſels) and by overcharging the Veſſels, elevated them into theſe ſmall Protuberances, and ſometimes burſting them, did thereby leave a Dent in the middle; which Dent having been ſerved by ſome Perſons, they firmly believed to be the Place where the *Ovum* was ſucked out, from whence ſprung the *Fœtus*. I was very ſorry that I did not get this *Uterus* without it's having been ſqueezed, for I do not queſtion, but that I might otherwiſe have plainly diſcovered all the Members of this *Fœtus*, ſince I could plainly obſerve it's Back-bones, even with the naked Eye, and that in a *Fœtus* not of quite five Days growth. I hope after this, no Body will pretend to ſay, that the Animal *in Utero* at the Beginning, is nothing but an unformed Maſs. Theſe Obſervations I made in *September*, 1718.

A Deſcription of the Mooſe-Deer *in* America. *By the Hon.* Paul Dudley, *Eſq; F. R. S.* No. 368, pag. 165.

XVIII. The Mooſe is thought peculiar to North *America*, and is one of the nobleſt Creatures of the Foreſt; the *Aborigines* have given him the Name of *Mooſe*, *Mooſůk* in the Plural.

There are two ſorts, the *Common light grey Mooſe*, by the *Indians* called *Wampooſe*; theſe are more like the ordinary Deer, ſpring like them, and herd ſometimes to thirty in a Company. And then there are the *large*, *or black*, *Mooſe*, of which I ſhall now give you the following Account.

He is the Head of the Deer-kind, has many things in common with other Deer, in many things differs, but in all very ſuperior. The Mooſe is made much like a Deer, parts the Hoof, chews the Cud, has no Gall, his Ears large and erect. The Hair of the black Mooſe is a dark grey, and upon the Ridge of his Back to ten and twelve Inches long, of which the *Indians* make good Belts. He has a very ſhort bob Tail. Mr *Neal*, in his late Hiſtory of this Country,

ſpeaking

ſpeaking of the Mooſe, ſays they have a long Tail; but that Gentleman was impoſed on, as to the other things beſides the Mooſe.

Our Hunters have found a Buck, or Stag-Mooſe, of fourteen Spans in heighth from the Withers, reckoning nine Inches to a Span; a Quarter of his Venſon weighed more than Two hundred Pounds. A few Years ſince, a Gentleman ſurprized one of theſe black Mooſe, in his Grounds, within two Miles of *Boſton*; it proved a Doe or Hind of the fourth Year: After ſhe was dead, they meaſured her upon the Ground, from the Noſe to the Tail, between ten and eleven Feet, ſhe wanted an Inch of ſeven Foot in height.

The Horns of the Mooſe, when full grown, are between four and five Feet from the Head to the Tip, and have ſeven Shoots or Branches to each Horn, and generally ſpread about ſix Feet. When the Horns come out of the Head, they are round, like the Horns of an Ox; about a Foot from the Head, they begin to grow a palm broad, and further up ſtill wider, of which the *Indians* make good Ladles, that will hold a Pint. When a Mooſe goes through a Thicket, or under the Boughs of Trees, he lays his Horns back on his Neck, not only that he may make his way the eaſier, but to cover his Body from the Bruiſe, or Scratch, of the Wood. Theſe mighty Horns are ſhed every Year. The Doe-Mooſe has none of theſe Horns.

A Mooſe does not ſpring, or riſe in going, as an ordinary Deer, but ſhoves along ſide-ways, throwing out the Feet much like a Horſe in a racking pace. One of theſe large black Mooſe, in his common Walk, has been ſeen to ſtep over a Gate, or Fence, five Feet high. After you unharbour a Mooſe, he will run a Courſe of twenty or thirty Miles, before he turns about, or comes to a Bay; when they are chaſed, they generally take to the Water; the common Deer, for a ſhort Space, are ſwifter than a Mooſe, but then a Mooſe ſoon outwinds a Deer.

The Meat of a Mooſe is excellent Food, and though it be not ſo delicate as the common Veniſon, yet it is more ſubſtantial, and will bear ſalting: The Noſe is looked upon as a great Dainty; I have eat ſeveral of them myſelf; they are perfect Marrow. The *Indians* have told me, that they can travel three times as far after a Meal of Mooſe, as after any other Fleſh of the Foreſt.

The black Mooſe are not very gregarious, being rarely found above four or five together; the young ones keep with the Dam a full Year.

A Mooſe calves every Year, and generally brings two. The Mooſe bring forth their young ones ſtanding, and the young fall from the Dam upon their Feet. The time of their bringing forth is generally in the Month of *April*.

The Mooſe being very tall, and having ſhort Necks, do not graze on the Ground as the common Deer, Neat Cattle, *&c.* do, and if at any

any time they eat Graſs, it is the top of that which grows very high, or on ſteep riſing Ground. In the Summer they feed upon Plants, Herbs, and young Shrubs, that grow upon the Land, but moſtly, and with greateſt Delight, on Water-Plants, eſpecially a ſort of wild Colts-foot and Lilly, that abound in our Ponds, and by the ſides of the Rivers, and for which the Mooſe will wade far and deep, and by the Noiſe they make in the Water, our Hunters often diſcover them. In the Winter they live upon Browſe, or the tops of Buſhes and young Trees, and being very tall and ſtrong, they will bend down a tree as big as a Man's Leg, and where the Browſe fails them, they will eat off the Bark of ſome ſorts of Trees, as high as they can reach. They generally feed in the Night, and lie ſtill in the Day.

The Skin of the Mooſe, when well dreſſed, makes excellent Buff; the *Indians* make their Snow-ſhoes of them: Their way of dreſſing it, which is reckoned very good, is thus: After they have haired and grained the Hide, they make a Lather of the Mooſe's Brains in warm Water, and after they have ſoaked the Hide for ſome time, they ſtretch and ſupple it.

XIX. The Dimenſions are exactly ſet down, as I took them myſelf, by laying a String along the Surface. *An extraordinary large left* Horn *of the Stag Kind, taken out of the Sea on the Coaſt of* Lancaſhire. *By Mr* J. Hopkins. N°. 422. pag. 257.

a e the Length of thirty Inches.

b b the Circumference above the third Branch, ſeven Inches.

c the Circumference above the ſecond Branch, eight Inches.

d d the Circumference between the Brow and ſecond Antler, eleven Inches.

e e the Circumference of ten Inches.

d e the Circumference of the Brow-Antler, $6\frac{3}{4}$ Inches.

e f the Length of the Antler, $16\frac{3}{4}$ Inches.

This Horn was drawn out of *Raven's Barrow Hole*, adjoining to *Holker Old Park*, by the Net of a Fiſherman, on the twentieth of *June*, 1727. The Tide flows conſtantly where it was found, and the Land is very high near it. *Fig.* 33.

It is now in the Poſſeſſion of Sir *Thomas Lowther*, Bart. of *Holker*, in *Cartmell* in *Lancaſhire*.

XX. Though the *Coati Mondi* of *Braſil* is ſeldom brought alive into *Europe*; yet there were two of them found in Captain *Green's* Ship, one of which died in my Cuſtody, of a Wound it had received in the Thigh, which I cauſed to be diſſected, and have ſent you the Acount of it, compared with that of the *Pariſian* Academiſts publiſhed of one of them; and which differs from theirs in ſeveral Particulars, moſt of which, as I believe, may proceed from the Difference of Sex, theirs being a Male, and ours a Female. *Of the* Coati Mondi *of* Braſil. *By Dr* George Mackenzie. N°. 377, pag. 317.

Theirs was ſix Inches and one half from the end of the Snout to the hinder part of the Head, ours was only four; theirs was ſixteen Inches from the *Occiput* to the beginning of the Tail, ours was ten;

theirs

theirs from the Inſertion of the Tail to the end, was thirteen Inches, ours twelve; theirs from the Top of the Back, to the Extremity of the fore Feet, was ten Inches, ours was ſeven; theirs from the Top of the Back, to the Extremity of the hinder Feet, was twelve Inches, ours eight; the Snout of theirs was very long and moveable, like that of a Hog, but ſtreighter and longer in proportion, but ours was only two Inches; the fore Paws had each five Toes, the Claws of which were black, long, and hollow, like thoſe of the Caſtor; the Toes of the Fore-paws were a little longer than thoſe of the Hind-paws; the Soles without Hair; the Palms and Soles of theſe Fore-paws were covered with a ſoft and tender Skin; the Sole of the hinder Paw was long, having a Heel, at the Extremity of which there were ſeveral Scales a Line broad, and five or ſix long, in all which they perfectly agreed.

The Ears were round, like thoſe of Rats, and covered at the Top with very ſhort Hairs, and in this they likewiſe both agreed, as they did in the Eyes, which were extreamly ſmall and beautiful, but there was ſome Difference in the Hair, for theirs was ſhort, rough, and knotty, blackiſh on the Back and Head; and the reſt of the Body mixed with black and red; but in ours the Hair was long, in proportion to the Animal, eſpecially on the Tail, and the whole was beautified with white and black Circles, which made it have a moſt lovely Aſpect: But from the Snout, down all the Throat and Belly, to the top of the Tail, and the inſide of the Legs, was of a reddiſh Colour. The Tongue of both theirs and ours was chopt with ſeveral Fiſſures or Strokes, which made it rough to the Touch. The *Inciſores* were ſix in each Jaw: The *Canini* were very large, eſpecially thoſe of the lower Jaw; but they did not turn up like Tuſks as theirs did; their Figure was not round, blunt, or white, like thoſe of a Dog, Wolf, or Lion, but ſharp by the means of three Angles, which, at the Extremity, formed a Point ſharp like an Awl: As to their Colour, they were greyiſh, and ſomewhat tranſparent: The *Gula* was large, and cleft like a Hog's; and the lower Jaw, as in a Hog, very much ſhorter than the upper.

We ſhall now proceed to the internal Parts. By the Diſſection we found in ours, as the *Pariſian* Academiſts did in theirs, that under the Skin, and between the Muſcles, there was a great deal of Fat, white and hard, like Tallow. Theirs being a Male had a *Penis*, provided with a Bone, whoſe Length did in proportion exceedingly ſurpaſs that of the Bones which are found in the *Penis* of other Animals; ſo we in ours, being a Female, obſerved, that it had an exceeding large *Matrix*, and that the Inſertion of the *Urethra* was upon the right Side of the *Vagina*. The *Epiploon* in ours, as in theirs, was very ſmall; it had little Fat, and was a Complication of Fibres and Fillets, rather than a Membrane; it was not laid upon the Inteſtines, but touched upon the Ventricle. In theirs they obſerved a very

Fig. 28.

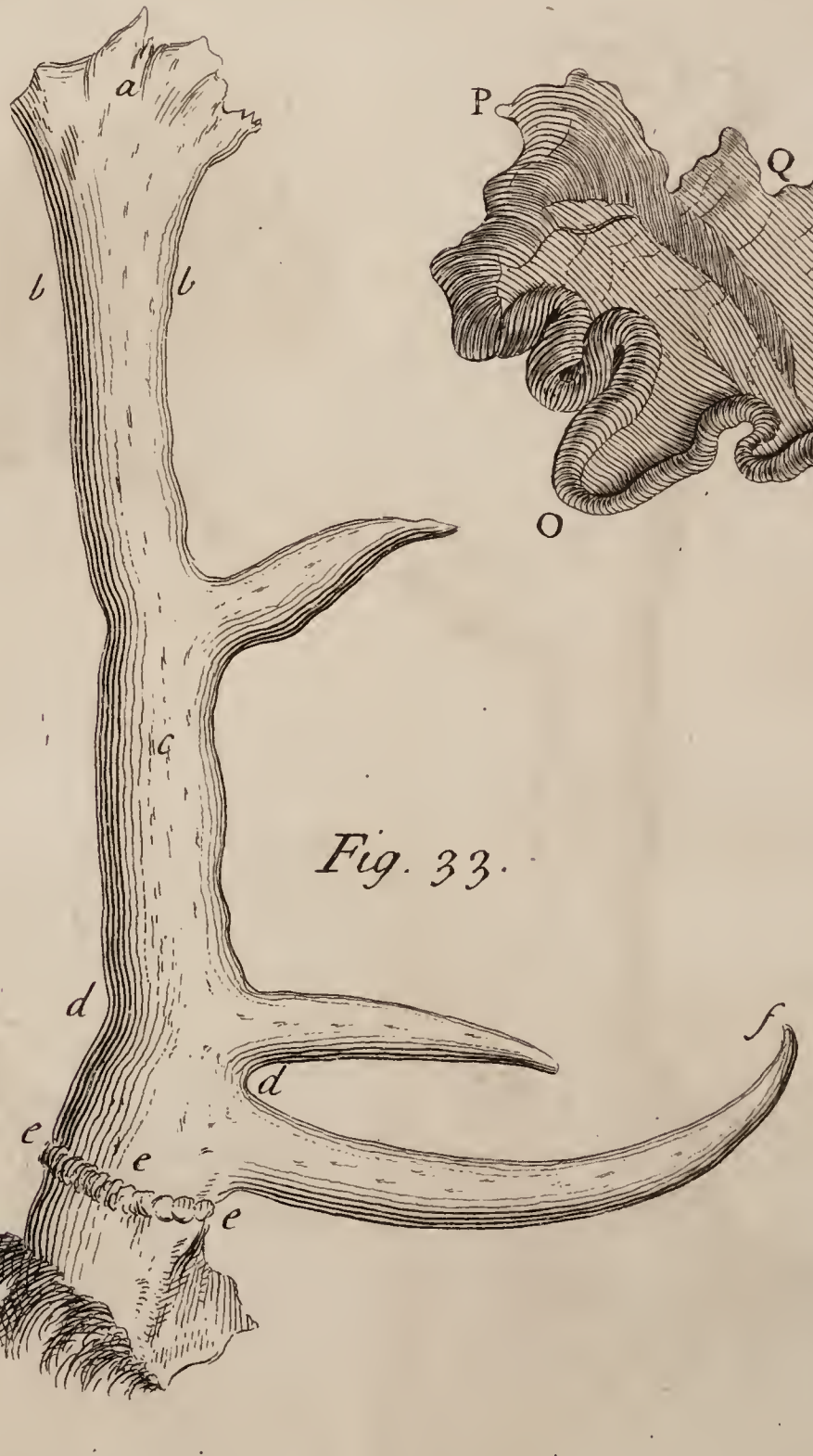


Fig. 33.

Fig. 29.

Fig. 30.

Fig. 31.

Fig. 32.

very large Spleen, but in ours we could diſcern none. We did not obſerve, more than they, any Veſſels in the external Membrane of the Ventricle, but the *Coronaria Stomachica*, which appeared as in theirs towards the upper Orifice, and ſoon diſappeared, ſhooting forth a few Branches. The Liver in ours, like theirs, was ſomewhat blackiſh, and of a Subſtance very homogeneous, without any Appearance of Glands: It had ſeven Lobes, two great ones on the left Side, and five other ſmall ones on the right Side. The *Pancreas* in ours, as in theirs, was faſtened along the *Duodenum*, inclining more towards the right Kidney than the left; but whereas it was very ſmall in theirs, it was very large in ours. The *Meſentery* in ours, as in theirs, was filled with a very hard Fat, which incloſed, and almoſt concealed all it's Veſſels. The *Inteſtines* in theirs were ſeven Foot long, and all of one Thickneſs, having nothing to diſtinguiſh them; but in ours they were only 42 Inches and a half. Theirs had no *Cæcum*, but we found it in ours at the upper end of the *Rectum*. The Bladder was very large; the right Kidney in ours, as in theirs, was a great deal higher than the left, and covered with the Lobes of the Liver. The Lungs in theirs had five Lobes, two on the right Side, and two on the left, and the fifth in the *Mediaſtinum*, which was as thin as a Spider's Web; but in ours there was ſeven Lobes, three on the right, and three on the left, and the ſeventh in the middle. The Heart in ours, as in theirs, reſembled that of a Dog, having the right Auricle extreamly great, and as they found a great deal of ſlimy Matter hardened in the right Ventricle, ſo we found in ours a *Polypus*. The *Muſculus Crotaphites*, paſſing under the *Zygoma* was in ours, as in theirs, faſtened there, being extraordinary fleſhy, even to it's Inſertion, made by a very large Tendon, which was incloſed between two Pieces of Fleſh, much thicker than thoſe which are generally found in this Place, and which are thought to be put there to defend and ſtrengthen the Tendon of the Muſcle of the Temples.

The Tendons in the Articulations of the fore Feet, were very big and ſtrong. In ours, we obſerved two Glands on each Side of the *Anus*, with a Paſſage to each of them, full of a greyiſh fœtid Matter. The *Orbita* in ours, like theirs, was not bony throughout, but it was ſupplied in the upper Part by a cartilaginous Ligament, which joined the *Apophyſis* of the *Os Frontis* to that of the firſt Bone in the upper Jaw. The Bone, which ſeparates the *Cerebrum* from the *Cerebellum*, was as in Dogs. The *Dura Mater* in ours did not adhere to the *Cranium*, as in theirs. The *Sinus's* of the *Os Frontis* in ours, as in theirs, were full of Matter, like a friable Fat. The *Mammillares Proceſſus* in ours, as in theirs, were very large. In the Eye both of them agreed exactly, the Globe not exceeding four Lines and a half in Diameter, the Aperture of the Lids being much larger, and the *Pupilla* being as large as the whole Globe of the Eye; the Cryſtalline contained three Lines in Breadth, and two and an half in Thickneſs, and

was more convex inwards than outwards: This Thickneſs of the Cryſtalline made the two other Humours to be leſs in Quantity. The *Choroides* was all over of the ſame Colour, *viz.* of a very brown red, without any *Tapetum*. which is hardly ever wanting in the Eyes of other Animals.

Theſe are all the remarkable Differences, that we could diſcover, betwixt ours and that of the *Pariſian* Academiſts; only I muſt inform you of ſome Things, as to the Manner of it's Living and Diet, which they had not the Opportunity to obſerve in theirs.

I believe they are miſinformed in ſaying, that they carry their Tails erected, at leaſt the Tail of this was always trailing on the Ground; neither can I be induced to believe that they eat their Tails, for there was no Part of her that ſhe could endure leſs to be handled than her Tail, the leaſt touching of which would make her cry, or rather hiſs like a Snake; ſhe could endure no manner of Cold; for in the Intervals, betwixt the Times of eating, ſhe was either beneath the Bedcloaths, or on a Cuſhion before a Fire, with the Heat of which ſhe ſeemed to be extreamly well pleaſed.

Her ordinary Meat was buttered Eggs, Milk, and Bread, all manner of roaſted Fleſh, but no Fiſh: I once tried her with a new killed Partridge, which ſhe eat of moſt voraciouſly, and for ſeveral Days after, ſhe was very wild and ungovernable, which made me never afterwards try her with raw Fleſh. I am apt likewiſe to believe, their ordinary Dens or Habitations are under Ground in ſandy Banks, like our Rabbits; for when ſhe was brought to the Fields, ſhe would dig up the Sands with her Paws, with an incredible Swiftneſs, ſo that had ſhe not been chained, there had been no Poſſibility of recovering her.

The Anatomy of the Mus Alpinus, *or* Marmot, *by* John James Scheuchzer, M. D. *F. R. S.* No. 397. p. 237.

XXI. Relictis abdominalibus muſculis, aperto abdomine, in conſpectum venit illico omentum pingue admodum, cujus tractus pinguedinoſi vaſis ſanguiferis epiploicis intertexti pulcherrimum formant rete; ſed eſt hæc omenti pinguedo concreta magis & compactior ea, quæ mox deſcribenda venit, ac veluti emaciata ut omninò judicare liceat, reſorptas eſſe per hyemem durante ſomno fluidiores oleoſi hujus liquidi partes per venam portæ, ut inſervirent tum ſecretioni bilis, quâ veſica bilaria fuit admodum turgida, tum nutrimento ipſius corporis.

Ex utroque hypogaſtrii latere copioſiſſima conſpicitur & laxioris, quàm illa omenti, conſiſtentiæ pinguedo, quæ inde à renibus ſeſe protendit ad inguen, formans veluti alterum, imò duplex omentum, quæ pinguedo, uti & illa meſenterii, quæ ductum inteſtinorum omnium comitatur, adeſt tum ad lubricanda viſcera abdominalia, tum in ſucci nutritii amplum penuarium.

Ad duodeni latus pro more, imò ultra ejus curvaturam, ſeſe protendit pancreas, idque valde extenuatum, in quo macilentiæ ſtatu vidimus omnes alias corporis glandulas, ſpeciatim eas, quæ muſculis interjacent; in his animantibus tardiſſima eſt ſanguinis circulatio, tardiſſimæ omnes corporis ſecretiones, nulla interim ſeri vel lymphæ, quæ

tardam

tardam quidem, ſed tamen ſucceſſivam habet ſecretionem, revectio, ut tandem ſanguis omni penè ſero orbetur; hinc non mirum, quod deficiente lympha ſecernenda, glandula pancreatis, & ſic quoque aliæ debeant emaciari.

Aperto duodeno in conſpectum prodit bilis ſpumoſa, quæ ipſa indicat ſeri defectum.

In fœmella hac uteri cornua ſeſe protendunt ad duos pollices Pariſinos, tubæ pertenues filo vix craſſiores ad ½ pollicis, ovaria 2 lineas circiter longa, unam lata, alba, ſub microſcopio pellucida, cum prominentibus ovulis diſtinctæ diaphaneitatis.

Hepatis ſatis magni lobi ſunt ſex, & aliqui horum in duos veluti ſubdiviſi per inciſuram: Lobo infimo mediante membrana connectitur cum rene dextro.

Renes pinguedine toti ſunt obſiti.

Renes ſuccenturiati ad latus venæ cavæ ſupra emulgentes corpuſcula ſunt flavicantia tres circiter lineas longa vix dimidiam lata, hepar inter & renes conſpicua; ſed uti aliæ glandulæ, macilentæ.

Ventriculi ſtructura eſt, uti in animalibus aliis prohibitis & carnivoris, ſimplex membranoſa, licet hoc animal ſit herbivorum.

Singularis ſtructuræ eſt fiſtula inteſtinalis in confinio inteſtinorum tenuium & craſſorum.

Ingreſſus ilei in colon in diametro habet duntaxat tres lineas; colon è regione ilei 2 lineas. Sed quod incurvatur ibidem cœcum, eſt ex ampliſſimis, 2 pollicum in diametro. Memorabilis eſt valvula coli dicta, annuli ad inſtar rotunda, ſingularis prorſus ſtructuræ. Exilis quippe admodum eſt.

Ingreſſus ilei veluti inter duas tunicas conniventes, ita ut nullus prorſus concedi poſſit excrementis ad inteſtina tenuia regreſſus. Et membranæ duæ, quæ mutuo occurſu valvulam illam formant, rhomboidalis ſunt figuræ. Adſunt præterea aliæ valvulæ conniventes annulares, & veluti in ramos protenſæ tres quatuorve principales verſus inteſtinum cœcum. Illuſtrat hæc obſervatio egregie uſum inteſtini cœci, quod in infantibus recens natis ordinariè eſt capacius. Inſervit nempe id diverticuli loco excrementis per novem menſium decurſum in inteſtinis colligi, nec per ea excerni ſolitis. Par hic eſt ratio animantium, quæ per hyemem integram in montium cavernis dormiunt. Nulla per illud tempus fit excrementorum egeſtio, & tamen non obſtante hâc tardiſſimâ circulatione atque ſecretione, nullâve ciborum aſſumptione, collectio fit eorundem, quæ ne inteſtina utriuſque generis infarciant nimium, amandantur ad cœcum, ibique ad uſque vernum tempus manent; regreſſus autem ex eodem ad colon impeditur imprimis per valvulas ante deſcriptas. Ex myographia ea imprimis contemplanda duximus, quæ actiones hujus animalis diſtinguunt ab aliis aliorum. Immediatè ſub cute craſſus eſt & fortis muſculus platyſma myoides dictus, qui colli partem anteriorem & lateralem, imò & totum muſculum maſſeterem faſciæ inſtar involvit. Ad ipſam uſque articulatio-

nem humeri cum cubito ſe protendens labio tum inferiori, tum ſuperiori inſeritur, & motum frequentem pedum anteriorum flexorium ſimul & labiorum inſigniter adjuvat. Hæc quippe Animalia cibos pedum anteriorum beneficio, veluti manibus apprehendentia, ori admovent, & terram illorum ope ſuffodiunt.

Glandulæ thyroideæ ad laryngis latera magnæ, haud dubiè ad irrigationem muſculorum vicinorum, quorum uſus admodum eſt frequens, quem ipſum in finem paſſim aliis muſculis interjacent alia corpora glandulosa paſſim memoranda.

Sternohyoideus & ſternothyroideus in ordinario ſunt ſitu.

Fortiſſimus & tendinoſus valde eſt maſſeter, maximi in his animalibus uſus.

Fortiſſimus item depreſſor maxillæ inferioris digaſtricus, qui baſi oſſis hyoidis & ejus cornibus forti item tendine à proceſſu ſtyloide ortus in maxillam inferiorem ad mentum ferè uſque inſeritur, cujus venter anterior imprimis eſt craſſus & poſteriori quadruplo fortior.

Loco geniohyoidei externi adeſt ſtatim ſub mento maſſa carnea muſculoſa craſſa, triangularis inde à maxillæ inferioris concurſu, ſive angulo, ſeſe in quinque lineas lateraliter protendens, quæ maxillam interiorem imprimis connectere videtur. Poſt hunc baſi linguæ inſternitur muſculus latus tranſverſis fibris carnoſis à maxillæ inferioris parietibus internis ortus, qui tum in mediam linguæ baſin, tum in os hyoides inſeritur; qui etiam ſupplere videtur geniohyoideum externum. Tenuis ille eſt & à ſubſtrato geniohyoideo interno, ſive geniogloſſo vix ſeparandus.

Styloglossus fortis quoque eſt muſculus, carnoſoque principio à proceſſu ſtyloide ortus in fortem definens tendinem.

Conſpicui valde ſunt muſculi cricothyroidei item thyrohyoidei.

Ad latera gulæ & aſperæ arteriæ glandulæ ſunt utrinque ad digiti ferè longitudinem protenſæ, quæ nonniſi elevata aſpera arteria & gula in conſpectum veniunt, & lubricandis his partibus inſervire videntur.

Fortis eſt muſculus rectus anticus major ejuſdem planè ſtructuræ uti in homine.

Ceratohyoides triangularis muſculus à cornibus oſſis hyoidis ortus in baſin ejus inſeritur.

Thyroarytænoideus ſub ſphinctere gulæ conſpicuus ad id ſpeciatim inſervit, ut clangorem his animalibus proprium efficiat conſtringendo fortiter Arytænoideas cartilagines.

Muſculi pterygoidei ſunt admodum fortes.

Ad ſupra jam deſcriptum platyſma myodes adnotandum porro, portionem craſſam ſatis inferi ſpinæ ſcapulæ, ſed quoque eidem muſculo tranſverſim implantari alium tenuem trapezio inſtratum, qui proin integer ex variis partibus coadunatus muſculus inſervit motui labiorum, flectendo cubito, levandæ ſcapulæ & antrorſum ducendis brachiis, quorum opera hæc animalia terram ſuffodiunt, aliaſque res ſuas peragunt.

Trapezius eodem prorſus modo ſe habet ut in homine.

Rhomboidis loco adeſt muſculus fortis ſub trapezio in conſpectum veniens, qui oritur non ſolum à ſuperioribus ſpinis vertebrarum dorſi, & inferioribus colli, ſed omnibus omninò ſpinoſis tranſceſſibus vertebrarum colli, & inſuper ab occipite, ita ut ſcapulam non ſolum retrorſum moveat, ſed etiam elevet, ſicque patientiæ muſculum in actione ſua adjuvet.

Inſertio haec rhomboidis in occiput obſervatur quoque in quadrupedibus aliis, & haud dubiè eum in finem adeſt, ut caput pronum pendens tanto melius ſuſtineatur.

Patientiae muſculus tenui principio oritur ab apophyſi tranſverſa primae vertebrae, & in principium ſpinae ſcapulae inſeritur.

Hujus actionem adjuvat alius eodem principio ortus, qui ad finem ſpinae dictae inſeritur, qui duo proin junctim ſumpti totam ſcapulam attollunt.

Serratum inter anticum majorem, qui eodem modo ſe habet uti in homine, & ſubſcapularem adeſt glanduloſa caro magna & lata fortibus his muſculis lubricandis inſerviens.

Serratus anticus major non ſolum dentatas habet origines à coſtis, ſed etiam fortes & craſſas propagines arceſſit à proceſſibus tranſverſis vertebrarum colli.

Aniſcalptor adeſt duplex unus alteri inſtratus, inferior & latior atque fortior dentatis veluti proceſſibus ab ipſis coſtis, imprimis inferioribus oritur, & inferiori ſcapulae coſtae in tranſitu firmiter annexus lata ſatis baſi humero uti in homine inſeritur, & praeterea propaginem mittit tenuem ad ipſum olecranon, ita ut non ſolum humerum retrodeorſum trahat, ſed etiam cubiti extenſioni inſerviat.

Muſculi humeri infraſpinatus, ſubſcapularis, & rotundus uterque eodem modo ſe habent uti in homine.

Deltoides duplex eſt. Ea pars, quae oritur à clavicula, & acromio in flexuram cubiti inſeritur, adeoque non tam ad humeri, quàm ad cubiti muſculos pertinet; altera verò portio, quae ab acromio & ſpina ſcapulae oritur, exteriorem humeri ſitum obtinet in medium circiter humerum inſerta; hunc proin non ſolùm ſurſum movet, ſed & extrorſum abducit.

Coracobrachiaeus tenuis eſt muſculus ejuſdem ſitus & uſus ut in homine.

Inter extenſores cubiti primus eſt tenuis, reliquis faſciae ad inſtar inſtratus, à coſta ſcapulae ortus; ſequuntur duo alii fortes, quorum unus etiam à coſta ſcapulae oritur, alter à ſuperiore parte humeri, qui aliquandiu progreſſi ſeſe uniunt & forti tendine in olecranon inſeruntur.

Sub his alius latet itidem fortis, qui à ſumma humeri parte ortus cum anconaeo ſeſe unit.

Hic ipſe autem fortior & craſſior eſt, quam in homine, & exterius atque inferius humeri latus occupat.

Inter

Inter flexores cubiti biceps ejuſdem eſt ſtructurae uti in homine.

Brachialis verò interni origo ſeſe protendit ad capitulum uſque humeri, & in ſuo progreſſu hic muſculus totam humeri externam partem veluti faſciatim ambit, & eodem loco uti in homine inſeritur.

Flexores carpi adſunt tres; Extenſores carpi tales ſunt, quales in homine.

Extenſores digitorum ſunt primò communis, qui in tres digitos priores inſeritur ab humero ortus. Secundus cubito deſcendens, in ultimum & penultimum inſeritur.

Adeſt & indicator ſ. extenſor indicis.

Pronatores ſe habent uti in homine.

Ex ſupinatoribus longus brevior eſt brevi, caeterum ejuſdem ſitus uti in homine.

Aliorum muſculorum deſcriptiones reſervamus in aliud tempus.

Figurarum Explicatio.

Fig. 34. *Fig.* 35. *Fig.* 36. *Fig.* 37. *Fig.* 34. *A B Gula. C D Duodenum. E Ventriculus. Fig.* 35. *E H Ilei portio G. H. Coli portio H F I. Cæcum omnia magnitudine naturali. Fig.* 36. *a a Coli valvula, prorſus fere uti depingitur in homine, niſi quod fermè ſit rhomboidalis; b c Apertura Ilei in Colon. Fig.* 37. *K Portio Cæci, cujus ima pars eſt aperta verſus Colon, ut Valvulae conniventes ramoſae* o o o *in conſpectum veniant.*

An Anatomical Deſcription of Worms found in the Kidnies of Wolves, by James Theodorus Klein, *Sec. of the City of* Dantzick, *F. R. S.* No. 413. pag. 269.

XXII. They were ſent to me from *Sewaldia*, in *Eaſtern Pruſſia*.

Fig. 38. exhibits a female Worm found in the Kidney of a ſhe Wolf.

Fig. 39. The Kidney of a Wolf, reſembling a Bag, on Account of the almoſt entire Conſumption of its *Parenchyma*. It contained eight Worms, ſome of a yellowiſh, others of a Blood Colour; two of which were Females, ſix Males.

The Females were more than twice longer and thicker than the Males. They were furniſhed with three very viſible Holes; the firſt of which performed the Function of the Mouth; the ſecond of the *Anus*; the third of the *Vulva*. This laſt Hole is ſeen under the Belly, about 1 ½ Inch from the Mouth, *a*, *b*, *c*, *Fig.* 40.

Fig. 38.
Fig. 39.
Fig. 40.

The membranous Skin was marked with annular Fibres, and 7 or 8 Cheſnut-coloured Lines, *d*, running the whole Length of the Worm. The Skin being cut, a limpid Humour iſſued forth, and then appeared the tranſverſal Fibres interlaid on every Side with the *Viſcera*, and are all round about, inſerted into the Interſtices of the *Veſicles* (of which hereafter) and at the ſame Time the *Viſcera* appeared, which the ſole Parts deſtined for Nutrition and Generation ſeem to make up.

Fig. 41.

The alimentary Paſſage, is compoſed of two Canals, one whereof *b*, *b*, which begins at the Mouth, and is about 2 Inches long, ſmooth, fleſhy, whitiſh, and endowed with thick Coats, ſerves for receiving Nouriſh-

Fig. 37.

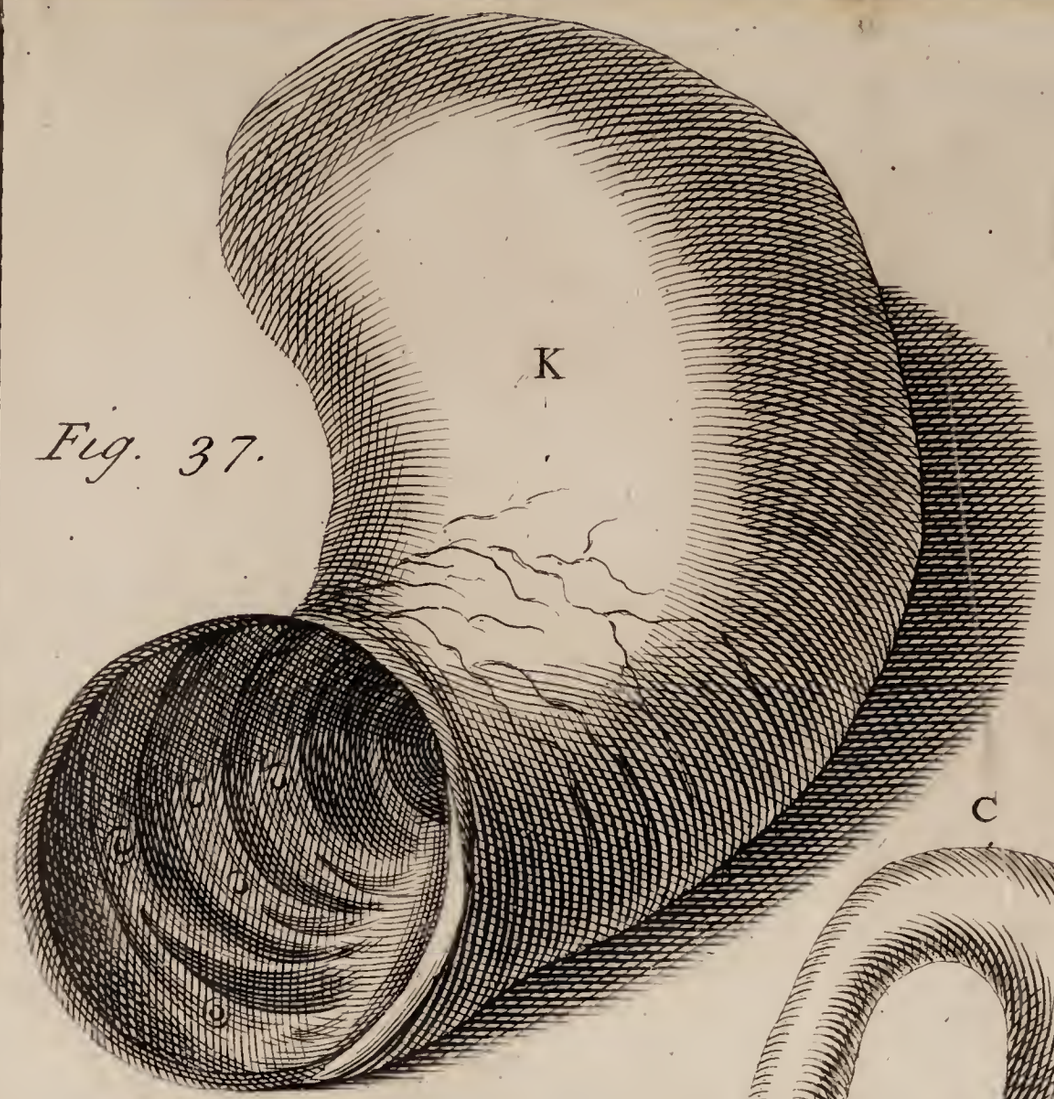


Fig. 34.

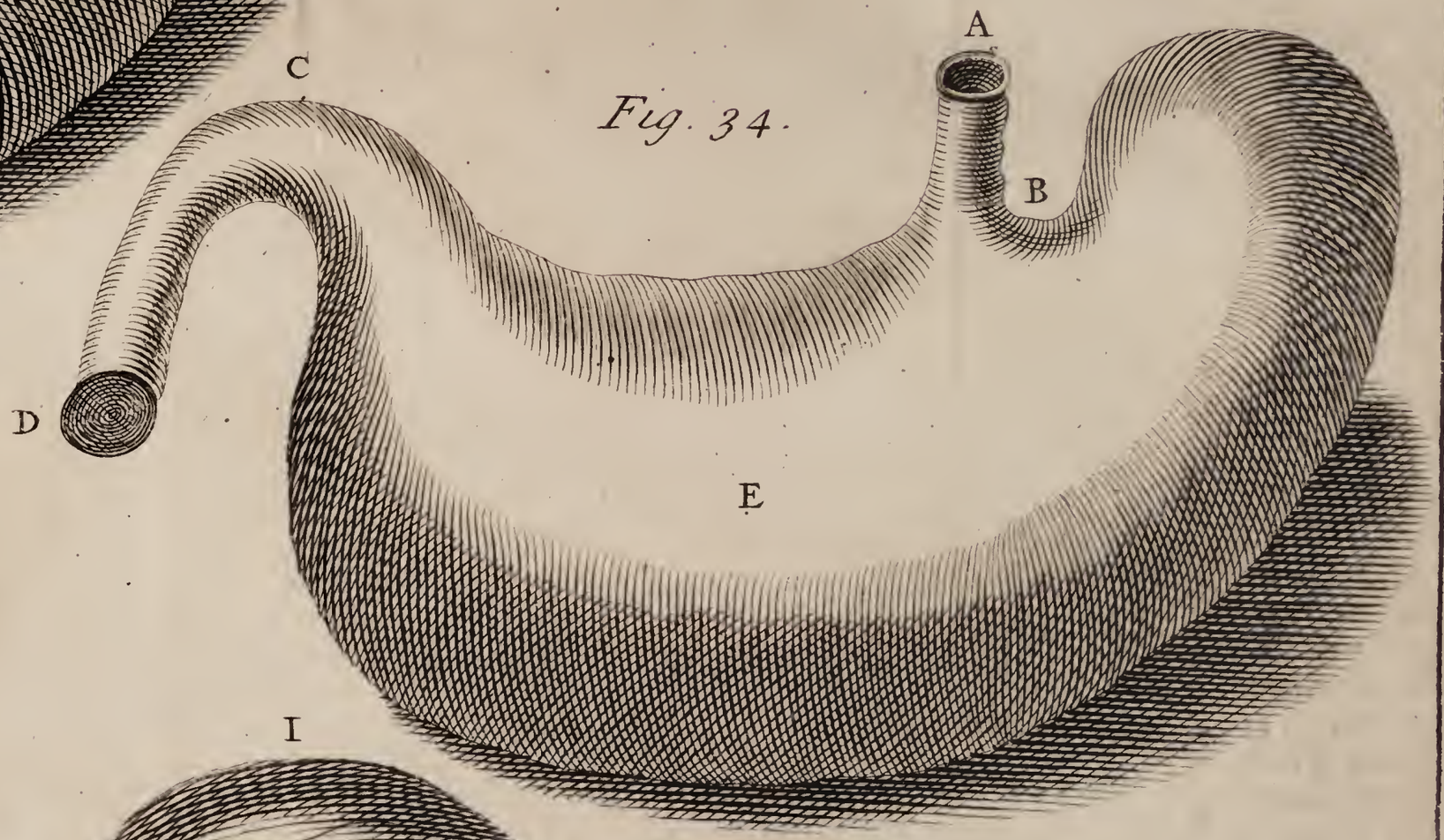


Fig. 35.

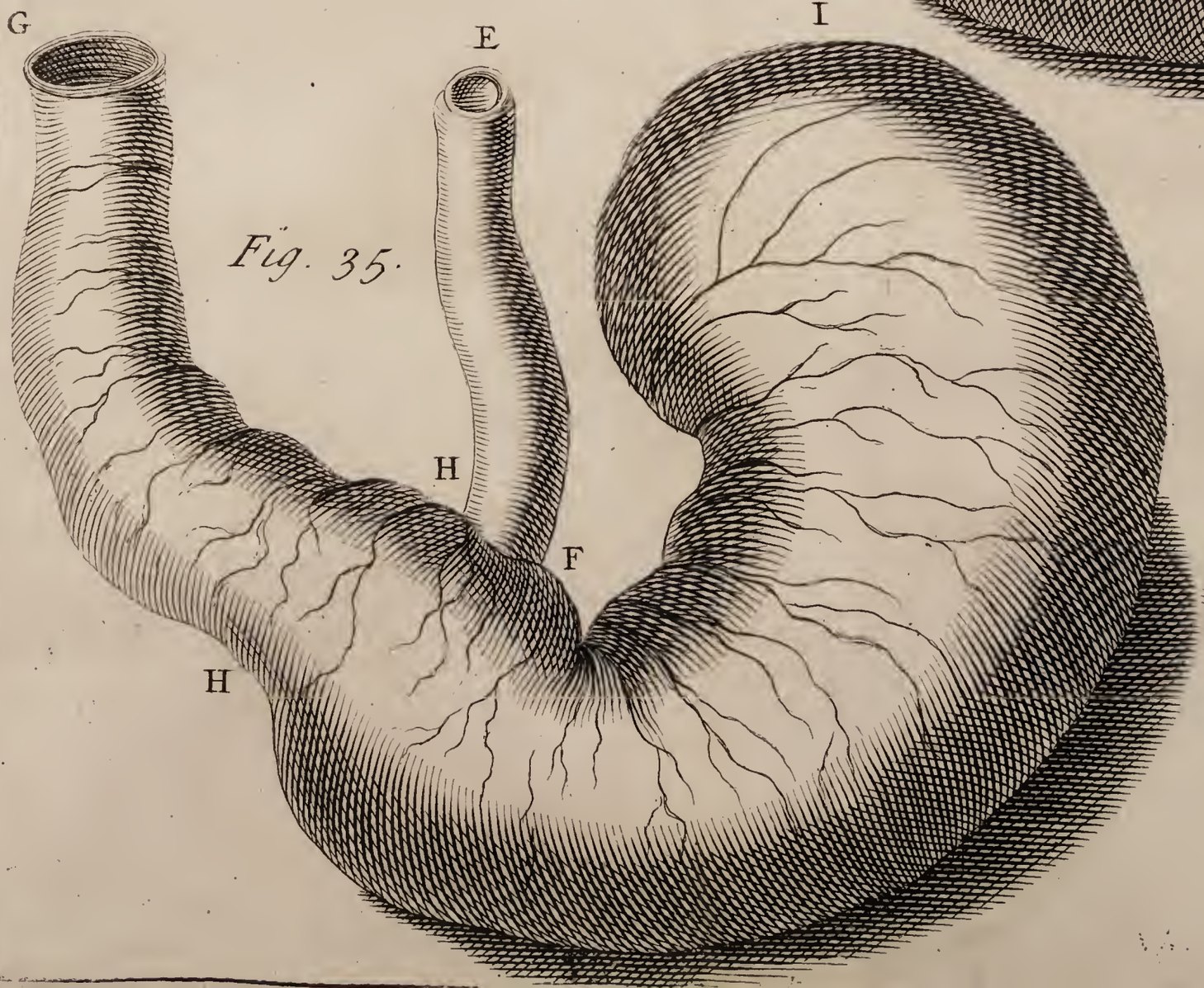
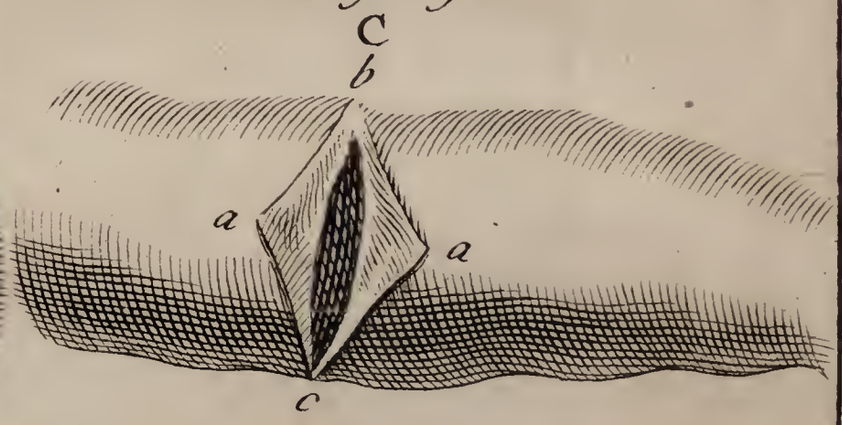


Fig. 36.



Nouriſhment. As this Duct proceeds with equal Thickneſs, it is once reflected and retorted before it enters the other, *c*, *c*, *c*, *d*. which is of a dark brown Colour, much broader and tenderer than the firſt, flatted, membranous, covered with very fine Coats, wrinkled like a Swathing Cloth, then runs into tranſverſal and winding Sinews, and extends in a ſtrait Line to the *Anus*. The inner Coat of this Canal ſeemed ſomewhat rough, and as it were ſtrewed with Duſt. The contained Liquor was perfectly fluid, and of a faint, ſooty Colour.

Near the *Anus*, was fixed to the Skin, the End of a whitiſh, tender Veſſel, which thence proceeded ſtrait to the beginning of the alimentary Canal, where reflecting towards it's Origin, and again reſuming it's firſt Way, after being contorted and implicated in many and various Windings and Curves, widens and ſtraitens here and there, until at length becoming more and more capacious, it forms a little Bag, for which a whitiſh, fine, ſmooth, Canal, about an Inch long, covered with pretty thick Coats, piercing through the Skin, 1 ½ Inch from the Mouth, prepares an Outlet, marked under the Belly with a Caruncle, *Fig.* 40. *c*. *Fig.* 42. *&* 43, *h*. This little Canal may be, not improperly, called the *Oviduct* or *Vagina*. *Fig.* 42, 43.

The Colour of theſe Parts is not every where the ſame; for of whitiſh at the Beginning, in the Progreſs it inſenſibly becomes darker: And at length, where the Veſſel acquires a greater Volume, and eſpecially where it ſtretches forth into the Bag, it is of a Cheſnut Colour. And as far as this Cheſnut Colour continues, the Veſſel is thick ſtuffed with *Myriads* of Eggs, and therefore is to be called the *Ovary*.

The Eggs, whoſe Number is incredible, ſeen with the naked Eye, reſemble a *Magma* of a brown Colour; but viewed through thoſe Microſcopes, which in the *Engliſh Apparatus* bear the ſecond and third Number, they are of the Figure marked *a* and *b*. *Fig.* 44.

The Surface of the inner Skin, which incloſed the abdominal Contents, was all beſet with ſmall whitiſh Bladders, of different Figures and Bulks, pouring out a Lymph upon tearing them. Theſe were in the Females.

Though the Integument of the Male be marked with annular Fibres, and as many Cheſnut-coloured Lines as that of the Female, throughout it's whole Length, yet his external Shape differs from that of the Female. *Firſt*, Becauſe, as I have already ſaid, he is much leſs. *Secondly*, Becauſe, the third Hole, *viz.* that under the Belly, is wanting in the Male. *Thirdly*, Becauſe the *Anus* of the Male is ſurrounded with a thick cartilaginous Membrane, of near an orbicular Figure, about a Line broad, externally convex, internally concave; on the Middle of which appears a Tubercle, divided by a fine Slit, which lets out the Excrements, and a very ſmall capillar Proceſs *k*.

The Cavity of the Belly contained a limpid Humour, the tranſverſal Fibres, the alimentary Canals, and ſpermatic Veſſels. *Fig.* 45.

The

The alimentary Paſſages had the ſame Situation and Structure as in the Female; the anterior Canal was of a whitiſh Colour, the poſterior, or wrinkled one, of a pale brown.

The ſpermatic Veſſels were very white, and ſlender, yielding, when wounded, a milky Humour. They are divided into two ſmall Branches, hanging out of a vermicular Proceſs (ſcarce an Inch long) which lies in the Belly, in that Place where the alimentary Canals are joined together, and leans on the Side of the wrinkled Canal, by the Help of the tranſverſal Fibres. Theſe Branches, in their Progreſs hence, creeping above and below the Canal of the Aliments, are very often reflected, intorted and folded; one at length freed from it's Windings, ſtretches away ſtrait towards the *Anus*, into which it is inſerted in the Shape of a pretty ſtiff Veſſel; but the other, at the Side of the wrinkled Canal, being preſſed, collected, and equally inflected, almoſt through it's whole Extent, by the tranſverſal Fibres, ends in the oppoſite Side, by an Extremity pendulous in the Belly, not far from the *Anus*.

The inner Coat of the Skin, juſt as in the Females, is all covered with ſmall whitiſh Bladders, turgid with Lymph, but leſs in Proportion to the leſſer Bulk of the Worm.

Fig. 46. We found under the wrinkled Canal a certain whitiſh Duct, marked with the Letters *b*, *b*, *b*, firmly connected to the aforeſaid Inteſtine by it's fineſt Part; but whoſe Outlet, or Origin, the Tenderneſs of the Inteſtine, and Fineneſs of the Duct hindred us from tracing with Exactneſs.

The Figures of the Worms, drawn according to their natural Bigneſs.

Fig. 40. The Shape of a Female Worm; *a*, the Mouth of the Worm; *b*, the *Anus*; *c*, the *Vulva*; *d*, the Cheſnut-coloured Lines, running along the Worm's Length.

Fig. 41. *a*, the Worm's Mouth; *b*, the alimentary Canal, which is white, carnous, *&c.* *c*, the alimentary Canal, which is brown and flatted, and whoſe Extremity is in the *Anus*; *d*, the Place where the Canals join; *e*, *e*, *e*, the tranſverſal Fibres; *f*, the *Anus*.

Fig 42. and 43. *a*, the Worm's Mouth; *b*, *b*, the firſt alimentary Canal; *c*, *c*, the latter alimentary Canal; *d*, the Place where theſe two Canals cohere; *e*, *e*, *e*, the tranſverſal Fibres; *f*, *f*, *f*, the white Veſicles turgid with Lymph, with which all the inner Skin is thick beſet; g, the *Anus*; *h*, the *Vagina*, *s*, the *Oviduct*; *i*, the Outlet of the *Vagina*, or the *Vulva*; *k*, *k*, the Ovary filled with innumerable Eggs; *l*, *l*, the preparing Veſſels.

Fig. 44. The Eggs viewed through a Microſcope; *a*, through the Microſcope, N°. 3; *b*, through the Microſcope, No. 2.

Fig. 45. A Male Worm; *a*, the Mouth of the Worm; *b*, *b*, the whitiſh alimentary Canal; *c*, *c*, the wrinkled Canal of the Aliments; *d*, the vermicular Proceſs of the ſpermatic Veſſels; *e*, *e*,

Fig.

a Branch of the ſpermatic Veſſels along the Side of the Inteſtin, compreſſed by the tranſverſal Fibres, and inflected through it's whole Extent in an uniform Manner; *f*, *f*, *f*, the Windings and Turnings of the ſpermatic Veſſels; *g*, *g*, the tranſverſal Fibres; *h*, the cartilaginous Membrane ſurrounding the *Anus*; *i*, the ſmall Slit in it's Middle; *k*, the very fine capillary Proceſs; *m*, *m*, the ſmall Bladders covering the Skin.

Fig. 46. A Male Worm inverted and diſſected about the *Anus*; in Order to ſee with Eaſe the Duct lying under the alimentary Canal; *a*, the wrinkled alimentary Canal; *b*, the whitiſh Duct under the wrinkled Canal; *c*, the ſpermatic Veſſels.

Fig. 47. *a*, vermicular Proceſs of the ſpermatic Veſſels; *b*, *b*, the Branches of the ſpermatic Veſſels, freed from their Windings; *c*, *c*, the ſame Branches diſſected.

XXIII. The external Maxillar Glands in Brutes are of the Conglomerate kind. They lie externally laterally (lengthways) on the lower Jaw, partly under the *Depreſſor Labiorum*, and partly under the *Buccinator*. A ſtrong Membrane intervenes between theſe Glands and the Jaw on one ſide, and between them and the Buccal Glands on the other ſide. They are more or leſs red (like the *Pancreas*) according to the quantity of Blood that remains in them, otherwiſe their Subſtance is white.

Of the external Maxillar, and other Salivary Glands: And of the Inſertions of the Lymphatics into the Veins; By Richard Hale, M. D. *F. R. S.* No. 364. p. 5.

Theſe Glands receive Arteries from the external Carotids, Veins from the external Jugulars, and Nerves from the third Branch of the *Par Quintum*.

The Number of excretory Ducts from theſe Glands, is not always the ſame, in the ſame ſpecies of Animals. In Cows generally fourteen are diſcovered by the Probe. Their Orifices are valvular, about four times leſs than their Ducts. Every Duct is about half an Inch from the next. Thoſe in the middle of the Glands are largeſt, becauſe the Glands are there broadeſt and thickeſt. The Ducts do not communicate with one another, nor with the Buccal. Every Duct is made of leſſer Ducts united, which riſe from the Lobules (thro' the whole ſubſtance of the Glands) which conſtitute each diſtinct Lobe and has the ſame Structure as the Pancreatic Duct. Each Lobe is depreſſed on it's ſides, where it is joined to other Lobes; and between the Lobes many Buccal Glands are interſperſed.

In Calves ſeldom more than ſix or ſeven Ducts admit any Probe; when the Animal grows older, the Ducts appear more plain and open.

In Sheep ſix excretory Ducts are always found in each external Maxillar Gland.

In Dogs and Cats, *&c.* theſe Ducts are fewer, in proportion to the ſmallneſs of the Glands. 'Tis obſervable that theſe Ducts in Dogs open obliquely towards the Mouth, whereby the *Saliva* may be better mixt with the Food in Maſtication; which might be ſwal-

lowed unmixt from another Structure of Ducts, in these Animals that swallow greedily.

Dr *Wharton* * first mentions the external Maxillar Glands. What he says of them, is applicable only to their appearance in Men, in which Subjects they are of the Conglobate kind, and very small, unless in Scrophulous and Venereal Cases. 'Tis plain that he had not seen them in Brutes; for in his Figures (which were drawn from Brutes) no notice is taken of these Glands. He describes them as very small and calls them Emunctories of the Nerves, which was the Notion (in his time) concerning the use of the Conglobate Glands; and the Saliva was said † *è Nervoso Genere profundi.*

‖ *Steno* justly blames *Blasius* for ascribing to the external Maxillars an Excretory Duct opening into the Mouth, like the common one from the Parotid Gland. Yet *Steno* (otherwise very accurate) does not truly describe these Glands, nor distinguish them from the Buccal, tho' they are as distinct from the Buccal, as the Sublinguals are from the internal Maxillars. *Steno* divides his Buccal into 3 Parts. The large Ducts in a Line rise from the external Maxillars; and how distinct these Glands are from the Buccal appears plainly in *Fig.* 54, *&c. Steno*'s 2d part of the Buccal, ‡ *intra quæ, & in mediâ parte*, are marked *e e*, in *Fig.* 51. *quæ alias*, &c. higher are the same *e e*, among the *Papillæ*. The third Part *quæ à superiore descendunt*, are *a b c d.*

The external Maxillars differ from the Buccal, in bigness, figure, structure, particular number of Ducts, colour, *&c.* The Buccal, Labial, internal Maxillar, and sublingual Glands, are of a yellow Colour; besides the Buccal are separated from the external Maxillars by a strong Membrane. Indeed many of the Excretory Ducts of the Buccal Glands open near the Ducts of the Maxillars (from whence *Steno* confounded these Glands) but they do so likewise round his own Ducts from the Parotids, and some Ducts from like Glands open near the Sublinguals, as also about *Nuck*'s Ducts, in which places the Buccal Ducts are most numerous.

In short, there is a very great Number of Excretory Ducts dispersed all over the Membrane, that invests the Mouth, *Fauces*, *&c.* which rise from Glands that lie under this internal Membrane. These Glands are more numerous in some Parts than others, and receive different Names, according to the Part they belong to; as Labial, Buccal, Palatine, *&c.* But these are small Glandules with one Excretory Duct, and tho' they separate Saliva like the large Conglomerate Glands, Parotids, Maxillars, *&c.* yet they differ from these in Conструcture, one common Excretory Duct, *&c.* Whereas the external Maxillars differ from all the other Glands of the Mouth, *viz.* by many ways from the Buccal, besides their Colour; in which particu-

* *Cap.* 21. † *Cap.* 21. *pag.* 134. ‖ *Obs. Anat. p.* 14. ‡ *Pag.* 18.

lar,

Fig. 38.

Fig. 39.

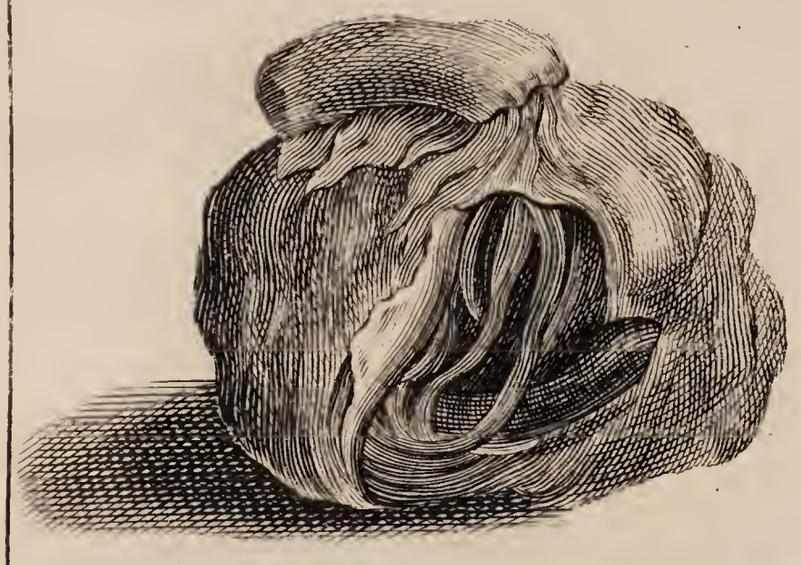


Fig. 47.

Fig. 40.

Fig. 41.

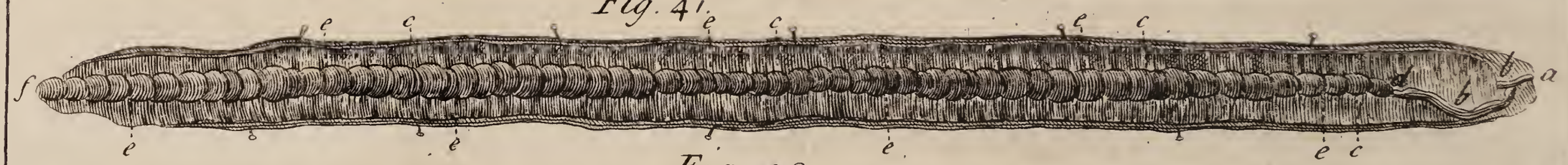
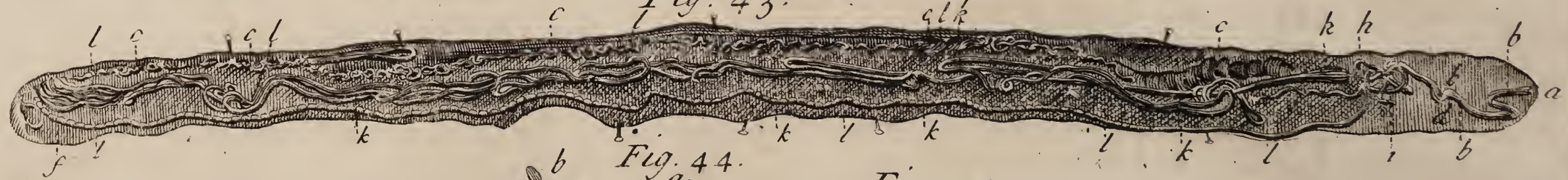


Fig. 42.

Fig. 43.



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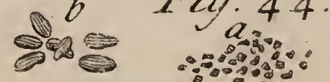
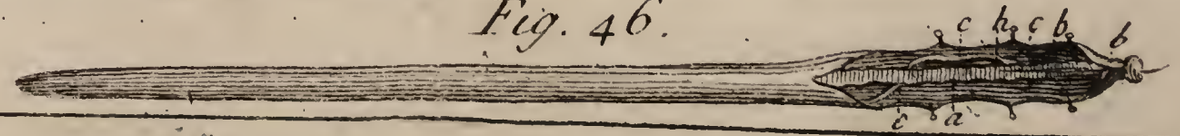


Fig. 45.

Fig. 46.



Toms sculp.

lar, they are alſo diſtinguiſhed from the internal Maxillars and Sublingual Glands; they differ alſo from theſe as well as from the Parotids, in having a great number of common Excretory Ducts. This number of Excretory Ducts was not obſerved by *Steno*, nor did he know that theſe Ducts in the ſame Line, were the Excretory Ducts of large Conglomerate Glands (like the Parotids) diſtinct from the Buccal.

Bartholine * mentions the external Maxillar Glands, but does not deſcribe them. *Nuck* † only gives them a Place in his Catalogue of Glands, but takes no farther Notice of them, though he writes a ‖ Book chiefly about a new Salival Duct riſing from a Gland, that is found in no Animal beſides a Dog.

Mr *Cooper* had never ſeen theſe external Maxillar Glands, as appears by a Letter of his (now by me) written above twenty Years ago, in anſwer to one I ſent him upon the firſt diſcovery of theſe Glands. The external Maxillars in Men (of the Conglobate kind) are marked *g* in the firſt Figure of his *Myotomia Reformata.*

The Ducts of the external Maxillar Glands are oppoſite to the Orifices of *Steno*'s Ducts; from which Glands and Ducts, as alſo from the Buccal, Labial, and Gingival Glands, the Saliva flows from all parts of the Mouth without the Teeth. From *Wharton*'s and the Sublingual Ducts, from the Tonſils, *Fauces*, *Fretum Stenonis*, Gingival, Lingual, and Palatine Glands, the Saliva is derived, from the upper and lower, former and hinder parts of the Mouth within the Teeth.

What has been ſaid of theſe Salivary Glands, *&c.* will be beſt underſtood by the following Figures which were drawn for me in *October*, 1697, by Mr *Burghers*, and have been lately compared with the Parts themſelves in Cows, Calves, *&c.* Theſe Figures are part of many more taken from Preparations at the ſame time, which were figured in the ſame Order as drawn. This is the Reaſon that the Cuts are marked in this manner, and it cannot be of uſe to alter theſe Marks and Numbers.

The Inſertions of all the Lymphatic Veſſels into the Veins can be diſcovered but in few Subjects, and no Figure as yet been given of them.

Theſe Figures ſhew the Courſe of the *Lympha* both below and above the Subclavians in Men, and Axillars in Dogs. The *Lympha* below the *Receptaculum Chyli* is conveyed from all the inferior Parts by a great Number of ſmall Lymphatic Veſſels, which uniting with others obliquely above the Valves, become bigger in proportion, till at length they conſtitute two large Trunks near the Emulgents, which are the *Pedunculi* or Beginnings of the *Receptaculum Chyli.* The *Lympha* from the Parts above the Subclavians, is derived in like manner from leſſer Lymphatics, to the common Ducts that are here delineated.

* *Pag.* 542. † Adenol. *p.* 5. *n.* 11. ‖ Sialog. *p.* 15. 158.

I know *Pecquet* has given a Cut of the Thoracic Duct in a Dog; which Duct is double from the Receptacle, and is inserted by four Branches into each Axillar. I believe with * *Bartholine*, (who has borrowed this Figure from *Pecquet*) that such an Insertion is a *Lusus Naturæ*. For though the Thoracic Duct may be double, and is sometimes divided into two Parts near the Subclavians, yet generally it is single, the *Lympha* from all Parts on both sides the Body being carried by proper Lymphæducts into one common Thoracic Duct, that conveys this Liquor, together with the Chyle from the Lacteals, into the left Subclavian Vein, by one, three, or more Branches. For there is as great a variety in the number of these Branches, as in the places of their Insertion.

Mr *Cowper* injected the Thoracic Duct in a Human Subject, and has given a Figure of that Preparation in his Book of Anatomy. But this Figure is imperfect, and the Insertion of the Thoracic Duct so ill drawn, that little can be learnt by it. However, no Anatomist has given any Cut, that demonstrates the Insertion of the Lymphatics from both Arms and both sides of the Head, *&c.* above the Subclavian Veins, which appear so plain in these Figures, that no Description can make them plainer.

Explanation of the Figures.

Fig. 48. *Fig.* 48, 49, and 50. Demonstrate the Passages, or Vessels, by which the Chyle and *Lympha* pass into the Veins of a Dog.

12. 12 Those Lymphatics that bring *Lympha* from the Thighs and lower Parts. 13. 13 Are lateral Lymphatics arising from the Groin, Testicles, and neighbouring Parts. 14 The Receptacle of the Chyle. 15 An Indenture in the Receptacle, through which passes one Tendon of the Diaphragm. 16 Lymphatics from a neighbouring Gland. 17 Some Lymphatics from the Diaphragm. 18 An Artery that serves the Loins, and runs through a Division of the Receptacle. 19 The *Pancreas Asellii.* 20 The *Vasa Lactea 2di Generis.* 21 The beginning of the *Ductus Thoracicus.* 22 Some Divarications of the *Ductus.* 23 The Continuation of the *Ductus*, and it's progress. 24 The *Aorta Descendens. N. B.* 18, 24. by their Pulsation (and the Tendon at 15) much promote the Ascent of the Chyle and *Lympha.*

Fig. 49. 25 A common Divarication of the Duct. 26 A Lymphatic from some neighbouring Gland. 27 A double Lymphatic from the secondary Gland 42, in *Fig.* 50. 28 That part of the *Ductus Thoracicus* where both it's Branches, and the Lymphatics from the left side of the Head and left Fore-Leg meet. 29 The Lymphatics from

* Barth. *p.* 616, and 620.

the

the left ſide of the Head and left Fore-Leg united; they lie on the inſide of the Vein. 30 A Lymphatic with a Pin in it from a neighbouring Gland, perhaps the *Thymus*. 31 A Lymphatic from the Neck, *&c.* it is divided and enters the Jugular by two diſtinct Branches under the *Sacculus* 43. 32 The Lymphatic from the right ſide of the Head. 33 The Lymphatic from the right Fore-Leg. 34 The large *Sacculus*, or Receptacle of the *Lympha*, on the right ſide, that receives all the *Lympha* on that ſide, and conveys it into the Jugular. 35 The *Cava Deſcendens*, 36 The *Vena Mammaria*, which is ſometimes ſingle. 37 The *Venæ Subclaviæ*. 38 The *Vena Vertebralis*. 39 The Axillars. 40 The Jugulars. 41 The right internal Jugular not injected.

Fig. 50, is *Fig.* 49 reverſed, the Duct, *&c.* being turned up, that the Inſertion, both *Sacculi*, *&c.* may be better diſcovered. This is to be explained by the preceeding, and has only from 42 to 44 more Figures than the upper part of *Fig.* 49. has; all which are already taken notice of. *Fig.* 50.

N. B. In this Subject the Chyle and *Lympha* are emptied into the Jugulars, and not into the Axillars; they are ſometimes emptied partly into the Jugular, and partly into the Axillar, or Subclavian. In Men generally into the Subclavian.

42 A ſmall ſecondary Lymphatic Gland on the back part of the top of the *Thorax*. 43 The *Sacculus*, that receives all the Chyle and *Lympha* from the whole Body (except 30, 31, 32, 33, 34.) and diſcharges it into the Vein at leaſt we know of no other Lymphatics that any where elſe enter into the Veins. 44 A Lymphatic, (or Membrane, for it was not injected) that joins 29 to the largeſt Branch of the *Ductus Thoracicus*.

Fig. 51, repreſents part of the left Cheek of an Ox, ſeparated from the lower Jaw-bone, with the external Maxillar Glands, it's Ducts, *&c.* *Fig.* 51.

1, 2, 3, *&c.* to 14. Briſtles inſerted into the Ducts of the external Maxillary Gland *l l l*. Theſe Ducts open ſloping into the Mouth, for the better mixture of the *Saliva* with the Food. 15 The Duct 3 injected with Wax, to diſcover it's Diviſion and Bigneſs, in reſpect of the Orifice. 16 A Lobulus of the Maxillar Gland. It's excretory Duct is filled with Wax, and ends at 15. 17 The Duct 1 laid bare and opened, to ſhew it's large Cavity, *&c.* A A, Part of the Muſcles and Fat, *&c.* belonging to the lower Jaw. B B, Part of the internal Membrane that inveſts the Mouth. *a b c d*, Briſtles in thoſe Ducts of the Buccal Glands, *n n*, that I could paſs any into. *e e e*, Thoſe Orifices of the Buccal Glandules, that were too little to admit Briſtles. *k k k*, The *Papillæ* on the inſide of the Mouth. *l l l*, The Lobes that conſtitute the external Maxillar Gland. *m m m*, The Orifices of the Labial Glandules *p p*, that were too ſmall for paſſing Briſtles. *n n n*, Buccal Glandules interſperſed between the Lobules of

of the Maxillar Gland. *n n n* near *r r r*, Part of the Buccal Glandules, where they appear thickeſt, and are raiſed to diſcover the Ducts *r r r* running under them. *p p p*, The Labial Glandules like the Buccal. Mr *Cowper* in *Fig.* 4. letters them H H. *r r r*, the Ducts marked 6, to 14. as they appear under the Glandules *n n*. *N. B.* The ſame Numbers and Letters expreſs the ſame Things in the following Figures.

Fig. 52. *Fig.* 52 Exhibits part of the left Jaw bone and Cheek of a Sheep, where the Briſtles 1, 2, 3, *&c.* ſhew the conſtant number of excretory Ducts from the external Maxillary Gland in theſe Animals.

Fig. 53. *Fig.* 53 Shews part of the right Cheek of a large Dog, taken from the lower Jaw-bone.

f, The Orifice of *Steno*'s Salival Duct. *g*, The Orifice of *Nuck*'s Duct, which riſes as a *Papilla* on the Membrane B B. *h*, *Nuck*'s new Duct, not found in Men, Oxen, or Sheep, but in Dogs, their Orbit not being entirely bony. *i*, *Nuck*'s Gland. *o o o*, The Orifices of ſome excretory Duct, belonging to the external Maxillar Gland, that were too ſtrait for the admiſſion of Briſtles. *q q*, The Teeth. In this Subject they are the Teeth of the upper Jaw; near the ſecond of which, the Orifice of *Nuck*'s Duct appears.

Fig. 54. *Fig.* 54 Demonſtrates the back part (next the Cutis) of the external Maxillar Gland of the ſame Dog, as it is beſet with the Buccal Glandules.

Fig. 55. *Fig.* 55 Explains the external Maxillar Gland in the right Cheek of a Cat. In this Subject I could only probe two Ducts, 3, *&c.* would not admit Briſtles.

Of the Membranes enclosing the Faſciculi *of Fibres, into which a Muſcle is divided. By Mr.* Leeuwenhoek, *F. R. S. Tranſlated by Dr* Sprengell. N°. 367. p. 129.

XXIV. In cutting off ſeveral thin ſlices from a piece of Beef; whenever I cut the fleſhy Fibres through tranſverſly, I could plainly diſcover the Membrane, as it is commonly called, which enelopes the fleſhy Fibres, and eſpecially the larger *Faſciculi* of them, as they run lengthways along the Muſcle. Between theſe *Faſciculi* the Membrane is of a conſiderable thickneſs, but ſpreads out every way into Ramifications exceeding ſmall, I had obſerved ſome Weeks before, that this Membrane was compoſed of an inconceivable number of very ſmall Veſſels, which were plainly to be diſcerned not only where the Membrane appeared of ſome conſiderable breadth, but even where it was not ſo broad as a ſingle Muſcular Fibre; but how far this held, I could not determine, foraſmuch as theſe ſmall Ramifications of the Membrane, did again ſpread themſelves into other Ramifications ſo exceeding fine, eſpecally where they encloſed the ſingle Muſcular Fibres, that they were in a manner inviſible even through my beſt Microſcopes.

The very ſmall Veſſels, which compoſe this Membrane, (as it is called) are doubtleſs framed to convey ſome nutritious Juices, yet they are ſo ſmall, that the Globules of Blood cannot paſs through them.

That

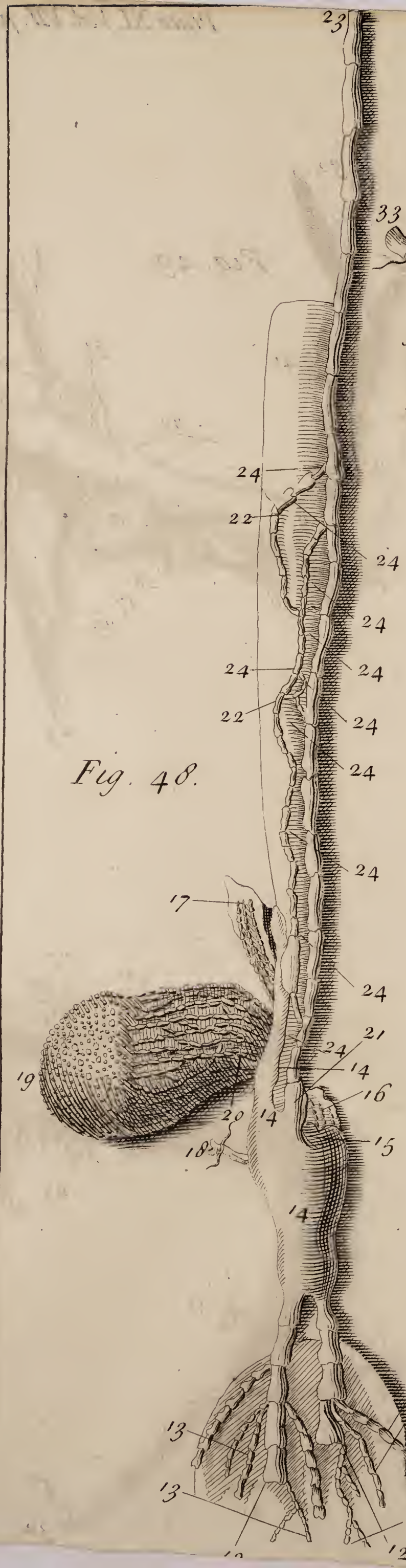


Fig. 48.

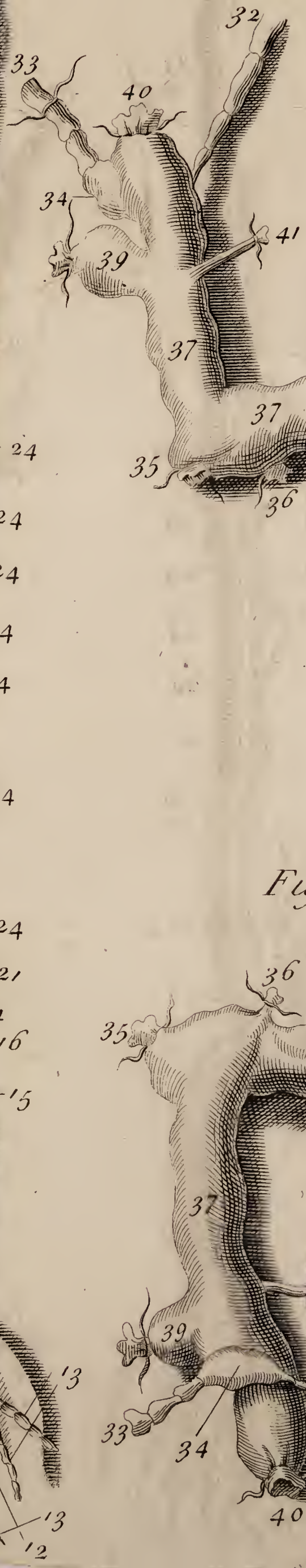


Fig. 49.

Fig. 50.

That this might be the better underſtood, I cauſed a ſmall piece of the Membrane to be deſigned, *A*, *B*, *C*, *D*, which, with the adjoining fleſhy Parts, is cut through tranſverſly, and ſince it was impoſſible for the Deſigner to draw the extraordinary number of Veſſels, which compoſed it, on Account of their being ſo exceeding ſmall, he has repreſented them only by Points. *Fig.* 56.

Although in my former Letters I gave ſome Draughts of the Carnous Fibres cut through croſs-way along with the Membranes, yet for the Satisfaction of thoſe who have not ſeen my other Letters, I have given them here another Draught of the ſame, between *E*, *F*, *G*, and *H*, *I*.

Theſe carnous Fibres, when wet, lay ſo cloſe to each other, that the ſpace between *E F G* and *H I* was quite filled up; but when dried, the Fibres were ſo ſhrunk, that one might ſee ſuch Spaces between them as are here delineated.

Now as we ſee, upon the drying of the Membranes *A F G*, and *D*, *E*, *G*, with the Muſcular Fibres between them, what a number of ſmall Ramifications proceed from the Membranes, as is here repreſented between the Muſcular Fibres; we muſt not imagine, that theſe Ramifications proceed only from the Points here repreſented, but that they are continued the whole length of the Fibres, and ſubdividing themſelves into ſtill finer Ramifications, they encloſe every ſingle Fibre in the whole Muſcle.

Amongſt ſeveral pieces of Fleſh, where the carnous Fibres were cut tranſverſly, I happened on one piece with it's Branches ſo plain, that the Membranes and Fibres looked like ſo many Boughs of Trees, with the Leaves on them, *K*, *L*, *M*, *N*, where *M* ſhews the ſo called Membrane torn off from another, as alſo how many Branches it runs into, and the many Fibres it covers. *Fig.* 57.

All theſe carnous Fibres, with the ſo called Membranes, lay very compact together, when I cut them off from the piece of Fleſh, as likewiſe when I laid them on the Graſs, and moiſtened them; but as the moiſture dried away, they ſhrunk again, in the manner here repreſented, and although the Deſigner could plainly diſtinguiſh the ſmall Veſſels which were cut thro', the largeſt of which appeared at *M*, yet he was obliged to mark them only with Points. Here you may obſerve, that all the carnous Fibres, having been cloſely tied together by the ſaid Membranes, by which they were enveloped, which are nothing but a congeries of Veſſels, could not be ſeparated from each other upon drying, but by tearing aſunder thoſe Membranes.

The carnous Fibres along with the ſo called Membrane, *K*, *L*, *M*, *N*, do not take up ſo much room, but that a grain of Sand may cover it, and yet one might very diſtinctly obſerve, in ſome of thoſe carnous Fibres, the parts of which they were compoſed.

This Obſervation I was reſolved to purſue in the Fleſh of a Whale, of which I had kept two pieces by me, for about 7 or 8 Years, of

about

about a Span long, and two Inches thick; from theſe I cut ſeveral Slices tranſverſly, but found that the carnous Fibres ſo cut through did eaſily ſeparate from one another, ſo that I could not find my Account in this, but thought that the Membranes were rotten. Therefore I cut off the outſide with a Table Knife, and then with a very ſharp Knife, I cut the inner part into very fine Slices, and there I found the Excrements of Mites, which were very ſmall, but globular, and ſome of them as ſmall as I had ever ſeen before, and ſo going on, I found theſe Excrements every where, eſpecially where the Membranes were thickeſt; then looking into ſuch places where the Membranes were thinneſt, inſomuch that I was ſatisfied, that a Mite, though juſt come from the Egg, could hardly find room there, there it was that I diſcovered in the ſo named Membranes, the aforeſaid Veſſels, and that in as great a number as I had ſeen them in the Ox's Fleſh, and as plain as one can ſee the holes in a Thimble with the naked Eye.

Of the Muſcular Fibres of different Animals, by the ſame. N° 367. p. 137.

XXV. 1. I cut off ſome very ſmall thin Slices from the Fleſh of an Ox, directly acroſs the length of the Fibres, and having placed them upon Glaſſes, and moiſtened them with clean Rain-water, I obſerved them with a very good Microſcope, and continued viewing them ſo long, that the fleſhy Fibres began to grow dry. I then ſaw, that in ſome Places the exceeding ſmall and fine Veſſels, which compounded the Membranes, wherewith the fleſhy Fibres were encloſed, were broken off from the fleſhy Fibres, by the unequal ſhrinking of the thin ſlice of Fleſh upon the Plate of the Microſcope. I ſaw at the ſame time ſome other of theſe ſmall Veſſels, which were ſomething ſtronger than the former, and were not broken off from the fleſhy Fibres, but yet were ſtretched and drawn from them to the diſtance of the Diameter of a Blood Globule. I ſaw likewiſe ſome fleſhy Fibres, which adhered ſo cloſe to other Fibres, that the ſmall Veſſels of Communication were not broken off or ſtretched, ſo that nothing was to be ſeen there, but only the Membrane encompaſſing the Fibres.

I likewiſe placed before the ſame Microſcope ſeveral other carnous Fibres, which I had ſeparated according to their length from the Fleſh of an Ox. In each of theſe I obſerved a great number of extreamly ſmall Apertures, by which I judged that the ſmall Veſſels of the Membranes had entered the Fibres; which Veſſels having been moiſtened with Water, as ſoon as the little moiſture, which had been left in thoſe Apertures, was evaporated, I could ſee them very plain and diſtinct.

Now ſince of late two Perſons of Note, have maintained, that the Blood circulated through the carnous Fibres; in order to examine into the Truth of this Hypotheſis, I pricked my Thumb with a fine Needle, and placed a little Blood upon the Glaſs, where the carnous Fibres lay with deſign to obſerve with my Microſcope, what was the pro-

portion

Fig. 51

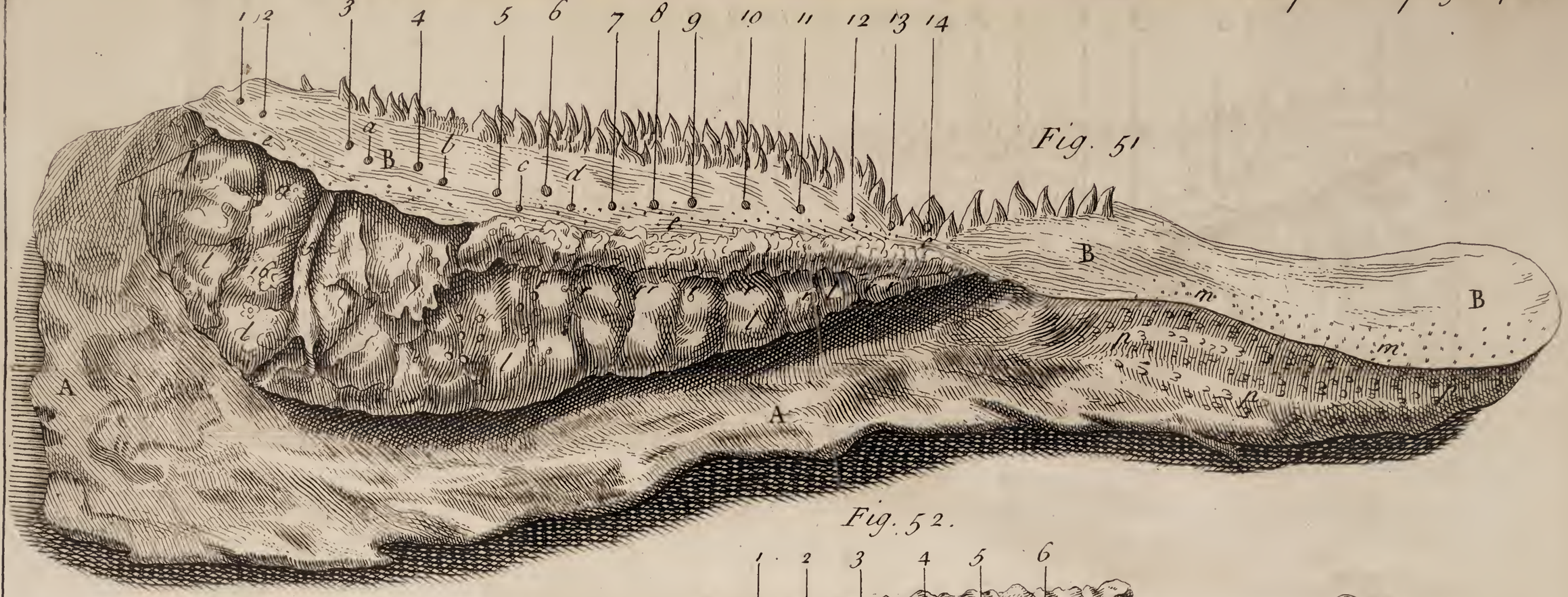


Fig. 52.

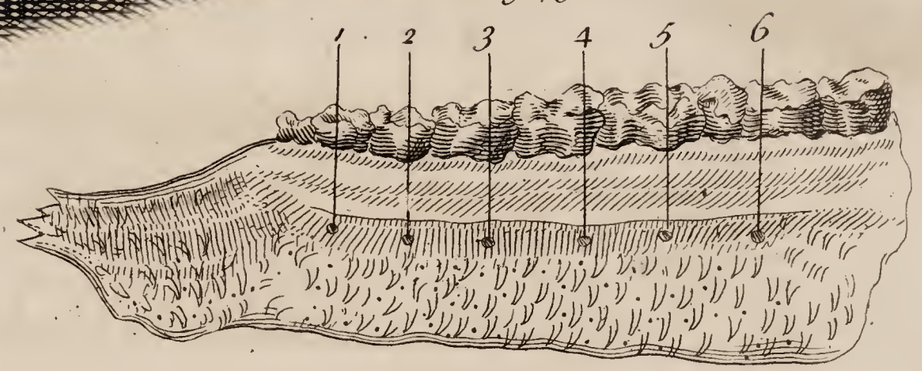


Fig. 53.

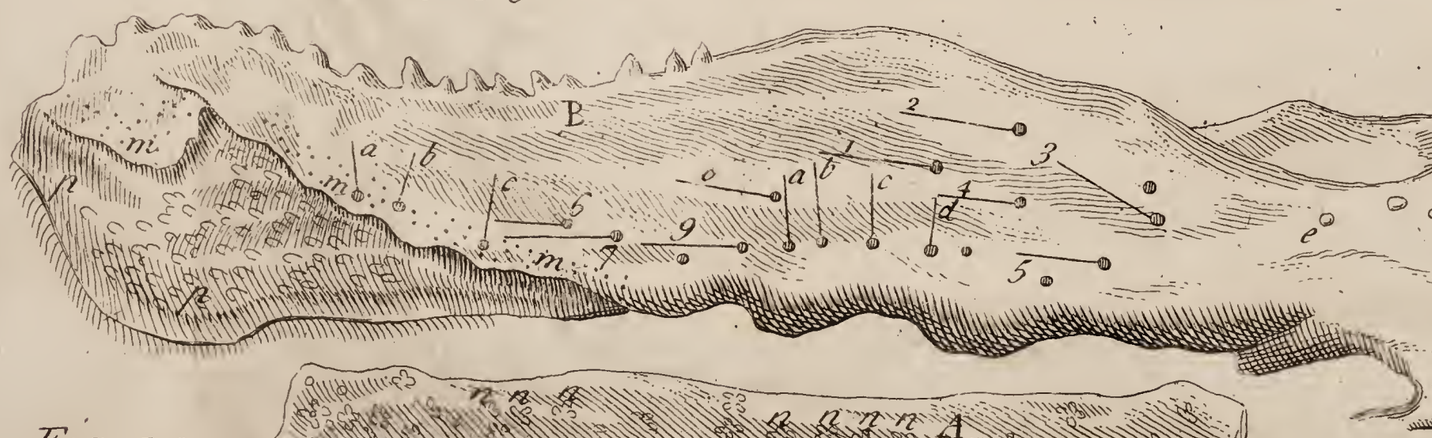


Fig. 54.

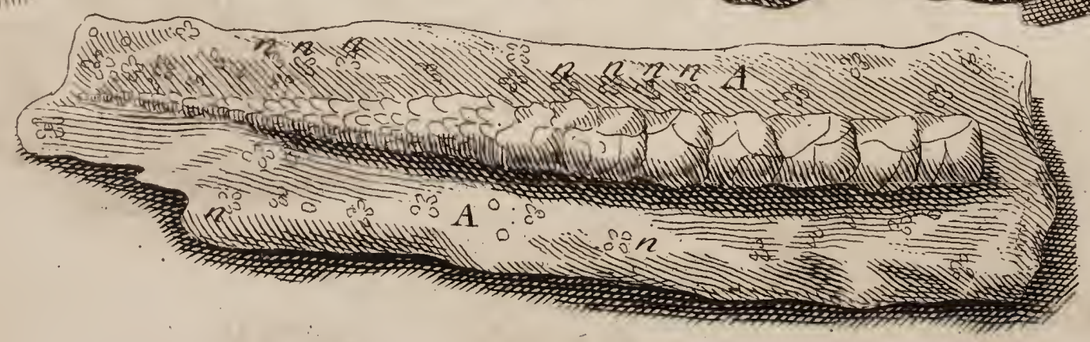


Fig. 55.

Fig. 56.

Fig. 57.

portion between the Diameters of a Globule of Blood, and of the aboveſaid Apertures, which I had ſeen in a Fibre.

While I was employed in theſe Obſervations, in came my Painter, who for theſe many Years has drawn all my Diſcoveries, and not being willing to truſt too much to my own Eyes, he being much younger and better ſighted than I, I placed before him the ſmall Apertures in the Fibres, which he ſaid was plain enough to be ſeen, and when he had viewed them to his Satisfaction, I placed before him likewiſe the Globules of Blood, which lay together in great numbers, and yet ſo diſtinct and ſeparate one from another, as one ſhall ſeldom ſee them. I then aſked him, what he thought to be the proportion between the Diameter of a Globule of Blood, and the Diameter of one thoſe Apertures in the fleſhy Fibre. After a little pauſe, he gave me for anſwer, that the Diameter of a Blood-Globule, was four times as large as the Diameter of one of thoſe Apertures. If ſo, then according to the known Rule, a Globule of Blood muſt be divided into 64 parts, before it can enter through one of theſe Apertures into a fleſhy Fibre.

This Diſcovery appeared to me very wonderful; and I am apt to think, that it will be very difficult to penetrate any deeper into the hidden Structure of the Muſcular Fibres, and the manner by which they receive their Nouriſhment.

Having committed theſe Things to Paper, my Thoughts ran again upon the Muſcular Fibres; and conſidering what I had ſaid formerly concerning them, that they were compoſed of long, ſmall Filaments, now I was not ſatisfied therewith, and therefore endeavoured to diſcover, whether theſe ſmall Filaments, which compoſe a carnous Fibre, might not really be ſo many ſmall Veſſels. With this deſign, I took part of the Fleſh of a Whale, which I had kept ſome Years by me, and cut it into very thin Slices directly acroſs the Fibres, and having moiſtened theſe thin Slices with fair Water, I placed them upon ſeveral Glaſſes, and before ſeveral Microſcopes, when I obſerved that what I had formerly taken for ſmall Threads or Filaments, were in reality exceeding ſmall Veſſels. I then cut part of the Whale's Fleſh lengthwiſe, in order to diſcover the Veſſels, which convey the nutritious Juice out of the Membranes into the Muſcular Fibres, which Veſſels then appeared to me in great Plenty and very diſtinct.

I afterwards took another piece of the Fleſh of a very fat Ox, which I cut through tranſverſly, and looking upon it with ſome of my beſt Microſcopes, I could plainly ſee, that how ſmall ſoever theſe Fibres were, they were ſtill vaſcular, for I could ſee the Light through the Apertures of theſe Veſſels, as I had done before in thoſe of a Whale; but if I happened to cut the Fibres never ſo little obliquely, inſtead of cutting them directly acroſs their length, the Light was not to be ſeen through them.

I had in a Drawer the hind Quarter of a Mouſe, which had lain there ſome Years; from the largeſt Muſcle of which I cut off tranſverſly ſome ſmall Slices, as thin as poſſible I could. Then placing theſe before my Microſcope, I not only ſaw, that the carnous Fibres were of the ſame thickneſs with thoſe of an Ox, but beſides I could ſee the Apertures of the Veſſels compoſing the carnous Fibres, as plainly as in the Fleſh of a Whale. The Veſſels in the Muſcular Fibres of a Whale, are indeed ſix times more in number, than in thoſe of an Ox, or a Mouſe, but then the Fibre of a Whale is alſo ſix times as thick as the other.

Hereupon I conſidered after what manner the Veſſels, of which the Muſcular Fibres moſtly conſiſt, received their Nouriſhment from the Veſſels of the Membranes; ſince the Muſcular Fibres, when they are at reſt, have many alternate corrugations, by which I judged, that the Veſſels in the Fibres muſt have their Sides preſſed together, and their Cavities cloſed up. But if we call to mind, that in walking a Man may move both his Feet above 3600 times in an Hour, (for he may make two Steps in the time of one Pulſation of the Artery,) and that in that ſpace of an Hour the Muſcular Fibres muſt be ſo many times extended and contracted, and will therefore require great Supplies; we ſhall likewiſe find that this is ſufficiently provided for, ſince upon every Extenſion of the Muſcle, the Apertures of thoſe ſmall Veſſels are free and open for the Carriage of Nouriſhment into the Fibres. This wonderful Structure of the Membranes, and the vaſt number of Veſſels they conſiſt of, as likewiſe the ſmall Veſſels of which the Muſcular Fibres are compoſed, has never yet to my Knowledge, entered into the Thoughts of any Man, and with many will hardly find Credit.

Continued by the ſame. N°. 371. p. 73.

2. The Muſcular Fibres of a Cod-Fiſh, and of a Pearch, being cut tranſverſly, I could ſee in them very diſtinctly the great number of ſmall Veſſels, that ran along the length of each Fibre. And I have ſeen the ſame in the Muſcular Fibres taken from the hinder Leg of a Mouſe, and cut through tranſverſly.

In ſpeaking formerly of the ſmall *Fibrillæ*, that help to ſuſpend the Teſticles of a Ram, I forgot to mention, that each of theſe conſiſts of exceeding ſmall Veſſels, which run parallel to it's Length.

I have at this time ſtanding before a Microſcope, a ſmall Portion of the Bone of an Ox, in which may evidently be ſeen the Veſſels which proceed from the Bone, and compoſe what is called the *Perioſteum*, as likewiſe the Openings of theſe Veſſels; the reaſon of whoſe appearing ſo clearly is, as I imagine, that they are filled with the Medullary Oil.

Of the Particles of Fat, by the ſame. N°. 367. p. 132.

XXVI. 1. After the Diſcoveries that I had made concerning the Circulation of the Blood, particularly that the Blood-Veſſels had no Endings, I began to conſider how the Fat Particles could be formed, ſince I did not think that they were ſeparated from the Blood, and came out of the Blood-Veſſels. But having now plainly diſcovered, that the ſo called Membranes were nothing but very ſmall Veſſels, and believing

believing that they were created for no other end but to tranſport Nutriment, as alſo that there was no Circulation in theſe Veſſels, I imagined that the Matter which we call Fat, was brought into them, which, when there was too great a ſupply of Nutriment, ſo that it could not be forced farther on, muſt be driven out of theſe Veſſels; for all the Particles of Fat, that I have as yet obſerved, are incloſed in ſmall Films.

This Original of the Fat is to me much more credible, than that it ſhould be forced out of the Blood-Veſſels; and yet how theſe fatty Particles, which conſiſt of ſmall Globules, and thoſe of ſtill ſmaller Globules (as it appears to me) are made and formed, I cannot as yet determine: As alſo where theſe Veſſels, which conſtitute what we call Membranes, have their beginning, and how this Fat is brought into them.

I had in my Drawer a piece of Ox's Fleſh, that I believe had lain there about four Years, wrapped up in a Paper, which Piece I found in ſome Places to be covered with a Membrane; from this I cut off ſeveral ſmall Slices along with the Membrane, and I found that near the Membrane, there lay about 16 or 18 Nervous Fibrils, which, in the drying of the Fleſh, were ſo ſqueezed together, that they were almoſt twice as long as they were broad. In ſome of which I ſaw very diſtinctly thoſe Veſſels, which are in the Nerves.

Theſe Nervous *Fibrillæ* were encloſed by a ſort of half round, ſeparating them from the Muſcular Fibres, which half round conſiſted of a row of ſmall Tendinous *Fibrillæ*, each of which was about twice as thick as a Hair of a Man's Beard. Without theſe Tendinous *Fibrillæ* lay the Muſcular Fibres, that had been cut through tranſverſly, and in this part of the half round there were ſeveral Apertures, which ſeemed in the Microſcope to be big enough for Hemp-ſeed to paſs through them, which might well be taken for Veſſels, but that there lay ſo many of them together. But conſidering that the Nerves are commonly covered with fatty Particles, I concluded that theſe Apertures were no Veſſels, but meer fatty Particles, which I found to be true when I had cut through them, and diſcovered that the inward Fat was eaten out by the Mites, which had left only the Huſks, or *Cortices*, of the Fat Globules behind: Which *Cortices* I never had as yet been able to diſcover, becauſe the *Cortices* of the Fat Globules would, upon any heat, melt away as faſt as the inward Fat.

2. I have formerly ſaid, that the Matter which we call Meal, or Flower, in Wheat, Rye, Barley, Oats, and in all ſorts of Beans, is ſhut up as it were, in little Cells, or Chambers, and that thoſe little Cells are ſeparated from each other by thin Membranes, which are thinneſt in Wheat, And as in the Enquiry into what is called the *Perioſteum* of an Ox or Sheep, I have often broke in Pieces the fat Particles thereof, and as often viewed them through a Microſcope; ſo have I likewiſe placed a few of the fat Globules upon a clean Glaſs Plate, and held it over a

Of the Particles of Fat; by the ſame. Tranſlated from the Dutch *by* John Chamberlayne; *Eſq;* N°. 372. p. 93.

Coal Fire, or the Flame of a Candle, till they were all melted and reduced into a liquid Matter; ſo that not only the Fat, which was ſhut up in the Skin of the fat Globules, but likewiſe the Skin itſelf was reduced to a fluid Matter: and thereupon I immediately brought it before my Sight; and viewing it with Attention, perceived, when the melted Fat was cold, that there were different Matters incloſed in the ſaid fat Globules; for there appeared an inconceiveable great number of exceeding ſmall coagulated Particles, and the reſt of the Parts, of which the Fat was compoſed, lay in one ſmooth and even Subſtance, and I have been conſidering whether there might not be incloſed in ſuch a Globule of Fat, ſo many little Cells and Partitions as we ſee in a little Grain or Seed, but if it be ſo, it will remain concealed from our Eyes.

But having now again carefully contemplated theſe coagulated Globules of Fat, many of which go to the making of one little Bubble, I did often fancy, that I ſaw, that each of the ſaid ſmall Particles was provided with ſuch a tranſparent Dent, as I have before ſaid, that the Meal Globules of Wheat, *&c.* are furniſhed with.

Nay, I have fancied to myſelf, though it did not appear to my Sight, that each fat Particle is furniſhed with little Cells within, like the Seeds or Fruits of Plants.

Since I wrote this, I was informed my Butcher had killed a Sheep of an uncommon Bigneſs, and that it weighed 140 Pounds, without the Fat that they took out of it, after it was killed, which weighed 51 Pounds, ſo that the whole Sheep weighed above 190 Pounds.

I cauſed a Piece of the Fat, that grew about the Kidnies to be brought to me, imagining that it's fat Particles would be of a coarſer Grain than thoſe of ordinary Sheep; for I have obſerved ſeveral times, that the bigger an Ox was, the larger were the fat Particles thereof; and ſince not one Man in a thouſand has any Knowledge of the Contexture of theſe fat Particles, for we find that there are not any two of one and the ſame Figure, they being compreſſed by other Particles with which they are ſurrounded, I have cauſed ſome few of theſe fat Particles to be drawn, as between A B C D. *Fig.* 58.

Now when we meet with one of theſe little Bundles of fat Particles, as has frequently occurred to us, in which the fat Particles were four times this Thickneſs; I imagine, that ſuch fat Particles cannot be produced out of one ſingle adipoſe Veſſel, but that out of ſuch a Veſſel ſeveral ſmall Sprigs iſſue forth, and out of each of thoſe ſmall Sprigs proceed others ſtill ſmaller, and that out of theſe Particles one larger fat Particle is formed like a Bunch of Grapes.

Now I cut off with a Razor the Fat in ſeveral Places of a greater Piece, as thin as I could, laying the thin Pieces upon ſeveral Glaſs Plates, and put them upon a Coal Fire, ſo as to cauſe them to melt; and being melted, immediately viewed them with a Magnifying-glaſs, when I obſerved the Skins, or membranous Coats of the fat Globules

lying

lying among the melted Particles, and in the ſaid melted Particles there was nothing to be perceived but a limpid Matter ſurrounded with ſmall Air Bubbles; but when the Fat was congealed, we could obſerve but very little of the Membranes, becauſe they were covered with the Particles of Fat, with which theſe Membranes or Skins had before been filled.

I cauſed a few of theſe Skins of the fat Globules to be drawn, between EFGH. During the ſaid Obſervation, I fixed my Eye with Attention upon the fat Particles of the Sheep which had been melted, and were again coagulated; and I could not but judge, that theſe fat Particles, which were exceeding ſmall, were analogous to that internal Matter, wherewith ſome of the ſmalleſt little Seeds are furniſhed, and in a great many of theſe exceeding ſmall Particles, I could in clear Weather diſcover ſome Tranſparency. *Fig.* 59.

Moreover, I cut as thin Slices as it was poſſible of the Fat, yea ſo thin, that five or ſix of them did not weigh a Grain, and put them into a little Water, in order to try whether I could make any farther Diſcoveries thereby, with reſpect to the ſmall Particles of Fat; but it was in vain: only I ſaw floating upon the Water very ſmall Particles of Fat, which were coagulated in a ſpherical Figure, and the very biggeſt of thoſe fat Particles was no bigger than a grain of Sand. I placed theſe Particles upon a Glaſs Plate; and viewing them with a Microſcope, I obſerved the Figure, which I mentioned above, as plain as before; and other fat Particles ſeemed to be of a different Figure, I put one of theſe into the Hands of my Painter, or Deſigner, bidding him to draw what he had obſerved, it being the Figure of one of the ſaid fat Particles, which was coagulated on the Water, as it is repreſented between I, K, L, M, which was not very conformable with the other melted fat Particles; for in the doing it, all the Particles did not melt, for the fat Particles are not all extracted by the Water, and coagulate upon the Water in ſmaller and greater globular Particles; and when we take out of it the Remainder of the thin Slices of Fat, which float upon the Water, and view them with a Microſcope, we find that many of the fat Particles appear intire to the Eye; and whereas they were before very ſmooth and even in their Sides, they were now changed into rough and uneven Particles; ſo that one ſhould be apt to think, that there were two different ſorts of Particles in the Fat, and that one ſort melted more eaſily than the other. *Fig.* 60.

Now in order to get theſe melted Particles of Fat out of the Water, without altering them, I made uſe of a round Glaſs, and with it ſkimmed the Superficies of the Water; by which means ſome of the coagulated Particles ſtuck to the Glaſs. Moreover, I did again melt ſome of the fat Particles, which had been coagulated upon the Water, over a Coal Fire, as they lay in the Water; and when they were again coagulated

gulated, viewing them with a Microſcope, I found the ſmall fat Particles to be yet ſmaller than thoſe that were melted out of the Water.

In this laſt Obſervation I obſerved, with Aſtoniſhment, the inconceivable number of Veins and Membranes, which were diffuſed thro' the Fat, and the multitude of ſeparated fat Particles, that were involved in their ſeveral Membranes.

After this there was laid before me the Hind-Quarter of a ſucking Lamb, over which was ſpread what we call the Net, or Caul; and having cut off ſome Pieces of the ſaid Net, or Caul, upon which there was little or no Fat, with a Pair of Sciſſars, and placing them before a Microſcope, I obſerved again, that the fat Particles, where there were very few of them included between the Membranes, were of a more globular Figure than in other Parts, where a good many lay together, and that in other Places they were preſſed or bruiſed, which I fancy was occaſioned by the Butcher's ſqueezing the Caul in that place with his Fingers; and in another Place the fat Particles had been ſo torn in pieces, that I could ſee nothing remaining but the Skins of the fat Globules.

Moreover, I ſaw that the fat Particles had ſuch a Pinch, or Dent, in them, as I have ſhewn, that there were in the Globules of Flower of Wheat; from which Spectacle, I am confirmed, more than before, in my Opinion, that the fat Globules might be ſeparated intirely, or in part, from the Skin with which they are ſurrounded, by opening the Dents, without breaking the Skin.

Then I took off the thin Membranes, which encompaſſed the fat Particles, and viewing them with a Microſcope, obſerved, that the fat Particles had imprinted a roundiſh Figure on the Membranes inclining to a hexangular Shape, that it was a Pleaſure to look on them; but in other Parts they were of an oval Figure.

Moreover, I took a flat Fiſh, which we call *Plaiſe*, and took off the Fat which adhered to the Veſſels, or Bones, and viewed it with a Microſcope, and obſerved, that the fat Particles were of ſeveral Sizes; and ſome were ſo ſmall, that I judged that fifty of the leaſt were no bigger than one great fat Globule; and moreover, I ſaw that many of the fat Globules had ſuch a Pinch in them, as we find in the Meal, or Flower, of thoſe little white Beans, which we call *French* or *Kidney-Beans*.

Afterwards my Servant brought to me the Fat of a *Pearch*, which was nine or ten Inches long, and taking a little of it, I viewed it with a Microſcope, but could not diſcover any ſmall Particles in it, nor any internal Dent, as I had obſerved in the Fat of a ſmall *Plaiſe*.

After that the Fat of the *Pearch* had lain an Hour or two upon the Glaſs, I viewed it again, and obſerved that the Particles were become ſmaller, and that the Skin of the fat Particles, which as yet was beſet with ſome fat Particles, was, as it were, ſhrunk, or wrinkled, and the Fat that was burſt out, lay about the fat Particles, and

was

Fig. 58.

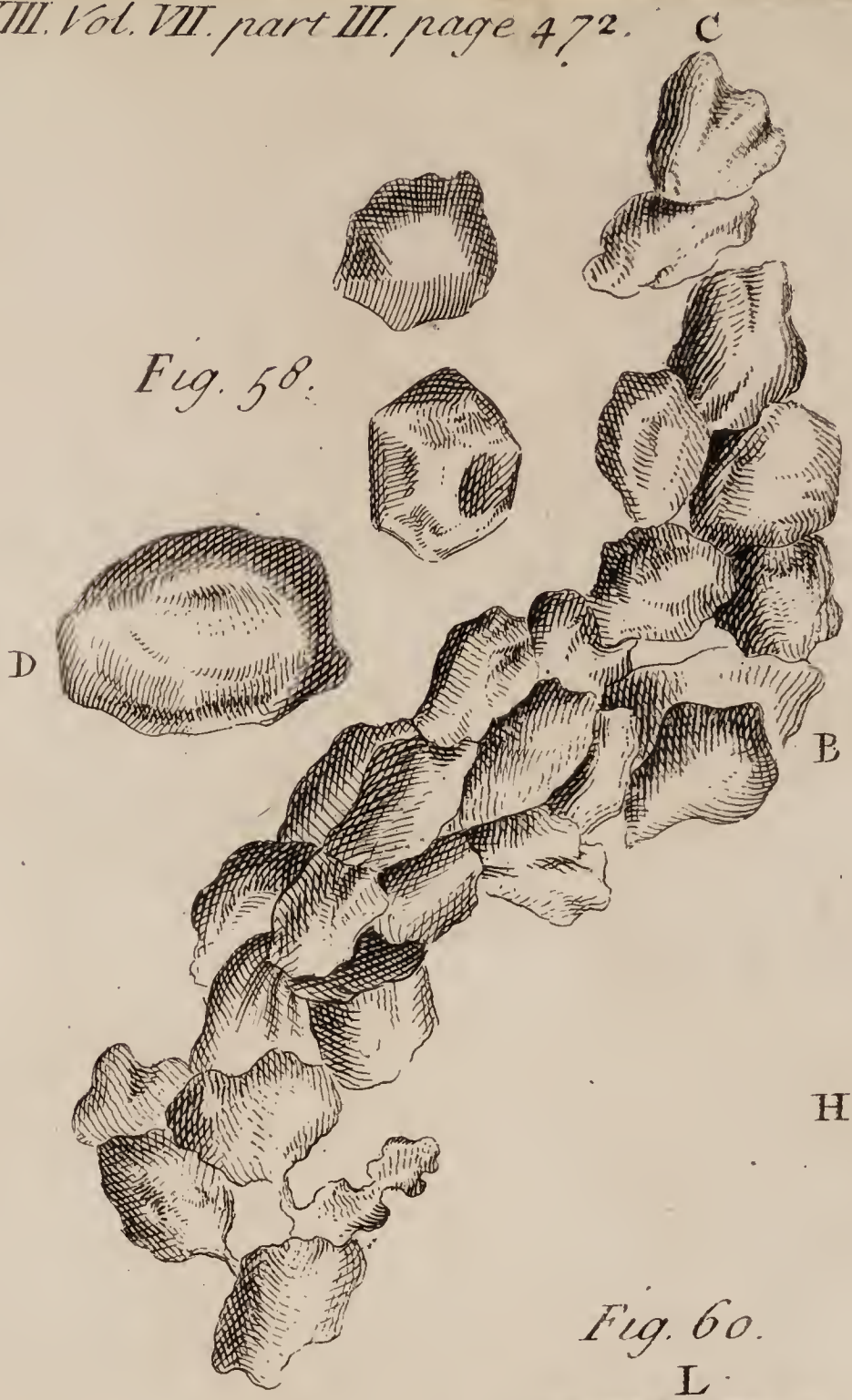


Fig. 59.

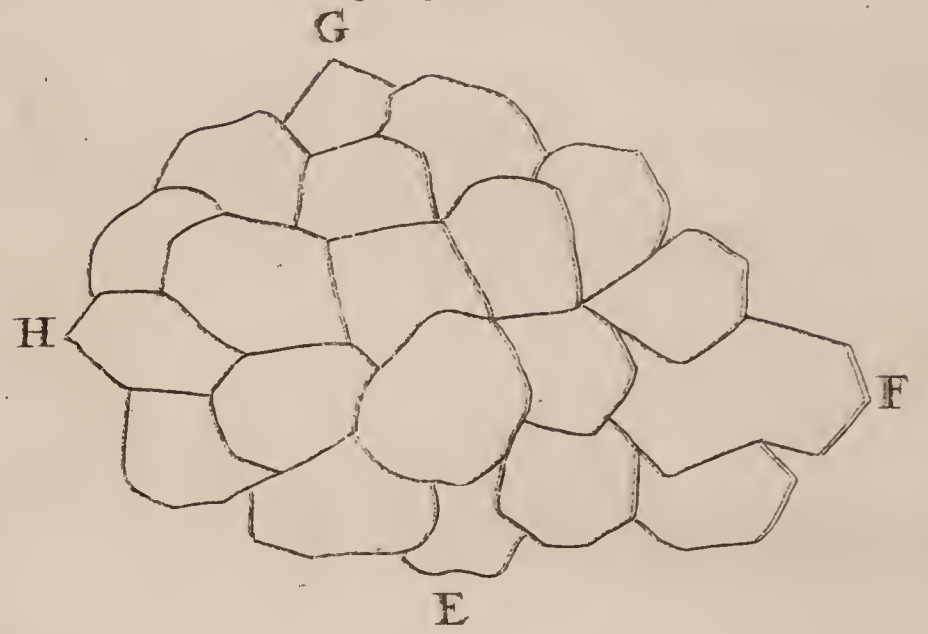
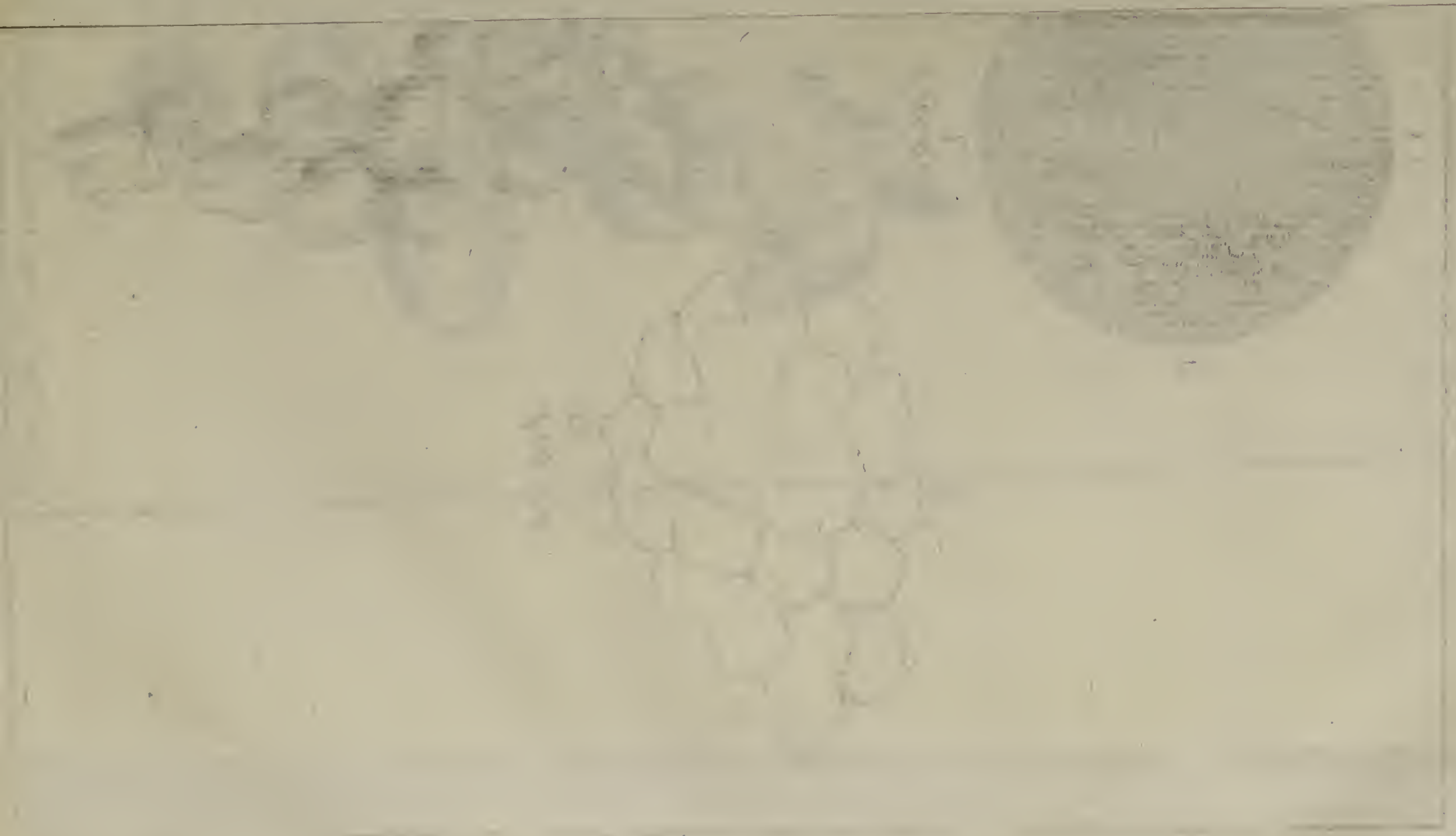


Fig. 60.



was ſo fluid and tranſparent, that we could not diſcover any Parts in it.

From this Obſervation I began to think, whether each of theſe fat Particles was not provided with an Orifice, or Hole, out of which the Fat might be protruded at all times, as often as the Parts of the Fiſh ſtood in need of Nouriſhment, without an entire laying open the Skin of the fat Globules; for we conſtantly find, that when the Eggs of the *Pearch*, which we call the Roe, increaſe in Bigneſs, it's Fat decreaſes; yea in ſuch a manner, that when the ſaid Eggs, or Roe, are arrived at their utmoſt Bigneſs, there is ſeldom or never any Fat to be ſeen upon the Inteſtines of the Fiſh.

XXVII. Mihi non incognitum eſt, quoſdam Anatomicos ſupra mea fundamenta novum ſtruere Syſtema auſos eſſe, affirmantes ovum eſſe proprium nidum, in quo animalculum ſeminis maſculini hoſpitatur, & quod idem ovum ex eo imprægnatum, poſtea per tubam *Fallopianam* deducitur ab ovario ad uterum. Sed percipere non poſſum quomodo poſitiones adeo vanas ſtatuere, eaſque in lucem edere audeant, adeo omni fundamento carent ut ulteriori contradictione indignæ ſint. Quamvis etiam contradictiones quamplurimas paſſus ſim, & adhuc patiar, permanebo in Syſtemate meo, quoniam animalcula in omnigenis ſeminibus inveni, ſi ſaltem animalia rite tractare poſſem, ne exceptis quidem variis avium ac piſcium ſpeciebus.

Of the Generation of Animals, by the ſame. N°. 380. p. 438.

Porro comperimus in omnibus arborum & plantarum ſeminibus, etiamſi parviſſimis, ſi modo tractari poſſint, plantam eſſe formatam, quam plantam antea comparavi cum animalculis ſeminis maſculini. Et farinoſa materia in ſeminibus plantarum plantis nutrimento eſſe debet tamdiu, quam planta ſuos ejecerit radices, & ex terra alia poſſit.

XXVIII. 1. Almoſt all the ſick Cattle refuſed every ſort of Food and Drink; they hung their Heads, had ſhiverings in their Skin, and in their Limbs; they breathed with Difficulty, and their Expiration in particular was attended with a ſort of rattling Noiſe; they were ſo feeble that they could ſcarcely go or ſtand upon their Legs. Some few of them eat a little, and drank very much; others had Fluxes of Excrements variouſly coloured, of a very offenſive Smell, and frequently tinged with Blood: Many of them had their Heads, and their Bellies ſwelled in ſuch a manner, that, upon clapping them with the Hand on their Paunches, or along the *Vertebræ* of the Loins, they ſounded like a dry Bladder when full blown. In ſome the Urine was very turbid, in others of a bright flame Colour. In comparing the Pulſes of the ſound Cattle with thoſe of the diſeaſed, he found the latter to be quicker and weaker. There was but little Heat perceivable by the touching any of them; their Tongues were ſoft and moiſt, but their Breath was exceeding offenſive. Beſides theſe Particulars, he was inform'd by thoſe who attended ſick Cattle, and by other Perſons worthy of Credit, that in ſome of theſe Beaſts they had obſerved crude Tumours in ſeveral parts of the Body, as likewiſe watery

An Account of a Book, intituled, Conghietture del Dottor Pietre Anton. Michelotti, Filoſofo, è Medico d' Arco, ſopra la Natura, Cagione è Rimedidell' infermità regnanti ne' Animali Bovini di molte Città, *&c.* Nell' Autunno del' Anno cadente 1711, in *Venezia*, 1712. N°. 365. p. 83.

watery Puſtules and diſorderly Motions of the Head, with dry, black, and fiſſured Tongues; that in others of them they met with Tumours, that came to maturation, putrid Matter iſſuing from the Mouth and Noſtrils, Worms in the *Fæces*, and in the Eyes, bloody Sweats, and the falling off of the Hair.

In comparing the Fleſh of the Cattle dead of this Diſtemper, with that of others killed for the Market, he found the Muſcles in the former lying immediately under the Skin to be ſomething livid. Having opened the three Cavities of the Body, he applied himſelf with the utmoſt Diligence to examine the Braine with it's Membranes, the *Trachea*, *Oeſophagus*, Lungs, Heart with it's Auricles, the *Vena cava*, *Aorta*, and Diaphragm; the Liver, Spleen, and other parts of the lower Belly. In all which there was no diſcernable difference, either as to Figure, Size, Contents, Situation, or Connexion, with the neighbouring Parts, from what was obſerved in ſound Cattle killed by the Butcher, except the Particulars hereafter mentioned. The Blood found in the Ventricles of the Heart, in the Pulmonary Veſſels, in the *Aorta* and *Cava*, though ſtill warm, was conſiderably blackiſh, and near a Coagulation: In opening the upper and middle Cavity, the Scent was offenſive, but tolerable enough, whereas the Stink, that proceeded from the lower Belly, was not to be endured without Prejudice. In ſome few Carcaſes the *viſcera* differed from their natural State, with regard to their Size, their Conſiſtence, their Contents, Colour, and Smell. In many of them the Paunch was found very much contracted and dried, with a hard Subſtance contained in it. In others the Lungs were ſwelled and livid, the Liver tumified, and the Brain watery and putrid.

Upon obſerving the aboveſaid State of the Blood in the Cattle dead of this Diſtemper; he was deſirous to ſee what Condition it was in, while the ſick Beaſts were yet living. With which Deſign having ordered ſeveral of them to be blooded, he found the Blood not to iſſue out of the Veſſels in a continued Stream, as uſual, but, with a broken and interrupted Flux, one part of the Blood not immediately ſucceeding another. Having cauſed the Blood to be received in proper Veſſels, and ſuffered it to ſtand for ſome Time, he found it intirely coagulated, without any Separation of the *Serum*, and attached to the ſides of the Veſſes lwith a reticular Pellicle upon the Surface expoſed to the Air. All the Cattle which were blooded, being eighteen in number, died in a few Days after the bleeding, one only excepted, in which the Vein was opened upon it's firſt being taken ill.

Having enumerated all the Symptoms of the Diſtemper, the Author concludes from the whole, that the Sickneſs among the Cattle was a malignant peſtilential Fever, killing almoſt all thoſe that were infected with it.

The immediate Cauſe of this he takes to be a præternatural thickneſs of the Blood, occaſioned by a beginning Coagulation of thoſe Parts of it, which conſtitute the *Craſſamentum*, whereby the Globules of the Blood, and the Particles of the *Serum* were impriſoned in a ſort of *Reticulum* formed by the Union of the Fibres of the Blood.

The occaſional Cauſe of this Sickneſs he deduces from the cold and wetneſs of the Seaſon, which rained all the preceeding Year, from *October* 1710 to *November* 1711, which Obſervation is worthy of Remark, ſince the Seaſon preceeding, the Mortality among the Cattle here in *England* was remarkably dry, and yet the Symptoms of the Diſtemper agreed with thoſe obſerved in *Italy*, as may appear from the Account given by Mr *Bates* in *Philoſophical Tranſactions*, N° 358.

2. The Author (after having briefly accounted for the two Kinds of the *Cocci Tinctorij* now in Uſe, *viz.* that of *Pliny* collected from the *Ilex*, and the *American Coccus*, or *Cochinil*) proceeds to give us the Natural Hiſtory of the *Coccus Polonicus*, which he calls *Radicum*, becauſe it is chiefly found adhering to the *Roots* of the *Polygonum Coccifera*rum, * *Koſmaczeh Polonis C. B.* This he takes to be the *Polygonum Germanicum, incanum, flore majore perenni Raij.* Of which he has given a Print with the *Cocci*, as they ſtick to the Roots.

The *Coccus*, he ſays, is found ſometimes ſingle, ſometimes more, even forty adhering to one Plant of different Sizes, from a Poppy-ſeed to that of a white Pepper-corn. It is roundiſh, ſmooth, and of a Purple Violet-Colour, and in a thin Cuticle incloſes a Blood-red *Succus:* One half, or more of it is covered with a rough, dark, brown, Cruſt, by which it adheres to the Roots.

The Countrymen gather it about *Midſummer*, and dry it with a ſlow Fire in Earthen Platters.

Several of theſe *Cocci* he expoſed to the Sun in open Glaſſes, and found that by the 24th of *July* every one, according to it's Size, had excluded a ſmall Worm with ſix Feet. That Part which ſeemed to be the Head, had two ſhort carnoſe *Antennæ*; for he could not perceive with Glaſſes any thing like either Mouth or Eyes. On the Back, Length-ways, were two *Sulci*, which were more or leſs viſible, according to the different Motions of the *Animalculum*. It's Feet ſeemed armed with Claws, and the firſt Pair ſtronger and darker than the reſt. The whole Worm was of an obſolete purple Colour, and had ſeveral Briſtles of a brown grey.

Theſe, after ten or fourteen Days, lay in a State of Reſt, and ſoon became covered with an exceeding white fine lanuginoſe Subſtance; in which Condition they continued five or eight Days

An Account of a Book entituled, J. P. Breynij, *M. D. F. R. S.* Hiſtoria Naturalis Cocci Radicum Tinctorij, quod Polonicum vulgò audit. 4to Gedani, 1731, cum Figuris. *By* Richard Middleton Maſſey, *M. D. F. R. S.* N° 421. *p.* 216.

* Koſmaczek Piloſel. Herbario Polon.

longer, and then laid their Eggs, fifty, one hundred, or more, a-piece; which to the naked Eye appeared but like ſo many red oblongiſh Points, but with Glaſſes looked like Ant's Eggs, almoſt tranſparent, with a diluted Blood-red Content.

Theſe Eggs being again expoſed in the Sun about *Bartholomew*-Tide, were hatched a Month after, when ſome *Vermiculi* were excluded, which in the Microſcope appeared to be Hexapods of a purpliſh Hue, with two *Antennæ* at their Head, and two greyiſh Briſtles at their Tails, ſcarce viſible except upon black Paper.

He ſuppoſes theſe laſt excluded *Vermiculi*, after ſome Wanderings, at laſt fix themſelves to the Roots, and ſome of the loweſt contiguous Branches of the *Polygonum*, where being deprived of local Motion and Senſe, by ſome Way or other they imbibe that *Succus* from the Plant, and at laſt become the *Cocci* ſo called, or Veſicles full of that Blood-red *Succus* ſo uſeful in Dying.

Corrections and Amendments by J. P. Breynius, *M. D. F. R. S. Tranſlated from the* Latin *by Mr.* Zollman, *F. R. S.* N° 426. *p.* 444.

3. In my Natural Hiſtory of the *Coccus Radicum*, when after many repeated Obſervations and Experiments (eſpecially thoſe of *Pag.* 16 and 17) I gave an Account of the Generation and Metamorphoſis of that Inſect, which uſes to ſtick to the Extremities of the Roots like a ſpherical Grain, and is commonly called *Coccus Polonicus*, I conjectured, that thoſe ſmall Flies which are often found among the *Coccus*, did not belong to the *Coccus*, but owed their Riſe to ſmall Worms of their own Kind, and were accidentally found among the *Coccus*; and as I could not find any Difference of Sex among the Worms of the *Coccus*, and following chiefly the Opinion of Signor *Ceſtoni* concerning the *Coccus* of the *Ilex* (however, as I freely own, not without ſome Repugnancy, and a fluctuating Mind) I ventured to aſſert, that our *Coccus* alſo is an Inſect of the Hermaphrodite Kind, which brings forth Eggs of itſelf, and from itſelf, and propagates it's Species without being impregnated by the Concurrence of a Male.

But the Summer following I began to be ſenſible that my Opinion was erroneous, and about the End of it was quite convinced of my being in the wrong.

Having repeated my Obſervations with the greateſt Exactneſs, and examined them in the ſtricteſt Manner, at laſt I found that the Metamorphoſis, or Evolution, thro' which our *Coccus* paſſes, is as follows.

A. Of the Male.	B. Of the Female.
I. The Egg.	I. The Egg.

The Eggs are laid about the End of *July*, or the beginning of *Auguſt*.

A. Of the Male.	B. Of the Female.
II. A Worm with ſix Feet, no Wings.	II. A Worm with ſix Feet, no Wings.

The Worms come out of the Eggs about the Middle of *Auguſt*, till the Beginning of *September*.

III. The leſs ſpherical Grain; that is, the *Coccus*, ſtrictly ſo called, of the Bigneſs of a Grain of Poppy-Seed or Millet at fartheſt, gathered from the 9th of *June* till the Summer Solſtice, with other bigger *Cocci*.	III. The larger ſpherical Grain; or the *Coccus* of the Bigneſs of a Vetch, or as large as that of white Pepper, which is gathered from the middle of *June* till about the middle of *July*.
IV. The leſs Worm with ſix Feet, no Wings. It comes out of the above-mentioned *Coccus*, from the Summer Solſtice 'till the Middle of *July*.	IV. The larger Worm with ſix Feet, no Wings. That is to ſay, the Female coming out in the Beginning of *July*, but chiefly about the middle of the ſaid Month; which being impregnated by the Fly, the Male, N° VI, brings forth the Egg, N° I.
V. The Nymph which appears about the Beginning of *July* and the following Days.	
VI. The Fly, the Male, coming out from the middle of *July* till the 24th of the ſame Month, which impregnates the Worm the Female marked N° IV.	

This Inſect, under what Shape ſoever it appears, *viz.* either of a Grain, a Male Worm, a Nymph, a Fly, a Female Worm, or a Worm coming out of an Egg, always when preſſed and cruſhed, affords a Matter of a purple Colour, which however is obſerved to run moſt copious in the *Cocci* and the Worms, eſpecially the Female ones.

4. A Diſpute ariſing betwixt the Author (*Melchior de la Ruuſcher*) and a Friend, concerning the Subſtance of Cochineal, the one maintaining it to be a ſmall Animal, the other the Fruit or Grain of a Plant, the Author took the Pains to procure from *Antiquera* in *New Spain*, the Place where there is the greateſt Traffick for it, the Atteſtations upon Oath of eight Perſons who have been immediately employed in propagating and managing it for many Years; from

An Account of a Book entituled, Hiſtoire naturelle de la Cochinelle juſtifiée par des Documens authentiques Amſterdam, 1729.

By W. Rutty, *M. D. R. S. Secr.* No 413. *p.* 264.

from whence the whole Natural Hiſtory of this Drug is collected. Theſe ſhew, *Firſt*, in Regard to Cochineal itſelf,

That they are ſmall living Animals with a Beak, Eyes, Feet and Claws; that they creep, climb, ſeek their Food, and bring forth Young, not changing their Species as Silk-Worms, but producing their Like; which are not larger than Nits, or ſmall Mites, or the Point of a Needle; but when come to Maturity, reſemble in Size and Figure, a Dog's Ticke. Thus far is certain, but their Manner of generating is doubtful, though it is commonly believed by thoſe who cultivate them, that they are impregnated by a ſmall Butter-fly, which is bred upon the *Nopal* (the Plant they live upon) which paſſes and repaſſes over them.

Secondly, As to the Manner of raiſing, nouriſhing, and managing, them, it appears, that at the proper Time, *viz.* after Winter (when theſe little Animals can bear the open Air) when the Cochineals which they have kept in their Houſes are grown ſo large and big as ſoon to produce young ones, they put 12 or 14 together into a *Paſtle*, or little Neſt, made of fine ſoft Hay or Straw, or Moſs of Trees, or the Down which immediately invelopes the Cocoa Nut. Theſe *Paſtles* are then placed upon the Plants of the *Nopal*, or prickly *Indian Fig* (which they take Care to cultivate well for this Purpoſe) and in 2, 3, or 4 Days, theſe Animals bring forth a great Number of young ones; ſoon after which the Mothers die. In the mean while the young ones, coming out of the Neſts, climb up the *Nopal*, fix themſelves to it, and ſuck it's Juice, which is their only Nouriſhment, but do not eat the Plant; and for this Reaſon, they always ſeek thoſe Parts of it that are greeneſt, and fulleſt of Juice, taking Care at the ſame Time to place themſelves on the Parts moſt ſheltered from the Wind and Weather. During this Time, whilſt they are growing up, and become pregnant, great Care *is* taken that no Vermin incommode or kill them, as alſo to keep them clean, and diſengage them from certain Threads, like Cobwebs, that grow upon the *Nopal:* As likewiſe to defend them from too much Heat, or Cold; from the Rain and Winds; becauſe the fine Cochineals are very tender: Nevertheleſs the wild Cochineals ſtand all theſe Inconveniencies; but then they are ſo gritty, of ſo ill a Smell, and of ſuch little Value, that they ought not to be mixed with the fine.

Thirdly, In Regard to the gathering of the Cochineal: The firſt is of the Mothers, which having brought forth their young, have died in the Neſts. Three or four Months after this, as the Seaſon permits, when the firſt young ones are become ſufficiently large and big, and are in a State to bring forth young in their Turn, and alſo have produced ſome few, the *Indians* carefully gather them off the *Nopals* with a little Stick, to which they fixed a little Hair in

the

the Nature of a Pencil. Theſe Animals being collected in this Manner, and afterwards killed by hot Water or Fire, this is called the ſecond Gathering, or rather the firſt of the young Ones that have been nouriſhed and raiſed in the open Air. Three or four Months after this, they gather the ſecond Brood of thoſe that have been born upon the *Nopal*, which being become big, have brought forth already ſome young Ones. This they do much in the ſame Manner as before, only now they take off the Plant a great many young ones with their Mothers, which makes this Sort of Cochineal be called *Granilla*, from the number of ſmall Ones found in it. In the mean Time they keep a Number of theſe young Ones alive, upon the *Nopals*, which they pluck up or cut, and lock up in their Houſes, to nouriſh theſe Animalcules during the rainy Seaſon. *Laſtly*, theſe being grown large, they put them into the *Paſtles*, and proceed in the Manner above expreſſed in the ſecond Article. So that for the moſt part they make three Gatherings in a Year.

Fourthly, As to the Manner of killing the Cochineal: This is commonly done two Ways, either in hot Water, or in *Tamaſcales*, which are little Ovens made for that Purpoſe, though there are ſome People who kill them by roaſting them upon *Comales*, which are flat Stoves with Fire under them, made uſe of by the *Indian* Women to bake their *Maiz* Bread. Theſe three different Methods give the Cochineal three different Colours. The firſt renders them of a brown red; the hot Water making them loſe the white Colour with which they are covered when alive. The ſecond makes them of an Aſh Colour and Marbled, or Jaſpered; both upon Account of the natural White with which they are covered, and the red and tranſparent Colour of the Cochineal itſelf. The third Sort becomes black, as if it had been burnt. Of the old ones which died after dropping their young, four Pounds produce but one, when dried; or rather, one Pound is reduced to four Ounces: But three Pounds only of the living, which have been carefully taken off the *Nopals*, being killed and dried, produce as much.

This is the Subſtance of what I can collect from the Atteſtations, *&c.* which are printed and annexed at length, which the Collector ſays he has done, both as they contain many Circumſtances unknown hitherto, both in his own Country *(Holland)* and elſewhere; and as the Curious may be now aſſured of a thing which has been very uncertain for ſo many Years, and indeed known but very ſuperficially, even by thoſe who have embraced the Opinion, that the Cochineals were really little Animals. And as there may be always a ſtanding Evidence to evince the Truth of theſe Facts, he has thought fit to depoſite the original Atteſtations, confirmed by the Certificates of three Magiſtrates, and three publick Notaries, among the other Regiſters of the

Royal

Royal Society, by the Hands of Mr. *East* Surgeon, a Member of our Body.

An Account of Mr Mark Catesby's *Essay towards the Natural History of* Carolina *and the* Baha-*Islands, by Dr* Mortimer, *R. S. Secr.* No. 415. p. 425.

5. Our Author proposes in this Work to give the Figures of the Birds, Beasts, Fishes, Serpents, Insects, and Plants, the greatest Parts whereof have never been described by any Author, or no good Figures given of them. He gives the Description of them in *English* and *French*, with Observations of the Air, Soil, and Water; and an Account of the Agriculture, Grain, Pulse, Roots, and other Productions of the Country, with a Map of the same. He was near four Years in these Parts, where he designed every thing from Nature in their proper Colours: In order to make the coloured Prints almost equal to his Original Paintings, he engraves and colours them with his own Hand.

CHAP. II.

The Structure, External Parts, and Common Teguments, of the Body.

Of the Callus *of the Hands and Feet, by Mr* Leeuwenhoek. *Translated by* John Chamberlayne *Esq*; No. 373. p. 156.

I. IN *Sept.* 1719, feeling an acute Pain in one of my Feet, at the Joint, between the Foot and the little Toe, which I imagined to proceed from the more than usual Thickness of the *Callus*, or hard Skin, upon that part; I caused my Servant, partly with his Nails, and partly with his Penknife, to take it off and let it fall upon a blue Paper. It was composed of little scaly Shivers lying upon one another, and the whole Piece was as large as a small Nail of a Man's Hand. I viewed the said Shivers through a Microscope, but could not satisfy myself, because they lay so irregularly on each other.

I took a little Bit of it, laid it on a clean Glass-Plate, steeped it in pure Rain-Water, and gently dividing it with a Piece of a Quill, I was amazed to see into what a vast Number of Particles it separated, and that with as much Readiness, as if they had never been joined.

Of these Particles, many were of the Figure of a Weaver's Shuttle, being broad in the middle and pointed at each End, with a Line in the middle, like those upon the uppermost or outside Skin of Fruits, or of our Bodies, but generally irregular; they were very thick, in proportion to their Bigness. I took two or three of them and laid them on a clean Glass, and put to them a Drop of Water, as large as a coarse Grain of Sand, and divided the same as well as I was able; and viewing the divided Particles through a Microscope, I was astonished at the prodigious number of exceeding small Particles that occurred

curred to my Sight, and which were of the ſame Figure as before ſaid.

I took ſome of the thickeſt Pieces of the horny Skin, but not half ſo thick as the Back of a ſmall Knife, and ſlit them into as thin Slices as I could, and placed them upon a clean Glaſs, with the Deſign of diſcovering the exceeding thin Particles lying upon one another; and having moiſtened them, they ſpread themſelves out further, and when became dry again, they ſeparated into ſeveral Parts; each of which were compoſed of many thinner Particles lying on each other. In order to have a clearer Notion of the Contexture of thoſe Particles, by which the Skin of the Hands and Feet of thoſe who are inured to hard Labour, or walk much, increaſes in Thickneſs, and is ſurrounded, I cauſed a ſmall Portion of the aforeſaid ſeparated Particles to be drawn, though they were not all ſo exact and compleat, as they are repreſented; and according to my beſt Obſervation, they had all been ſeparate Pieces, and none of them united to one another. *Fig.* 61.

Again I placed little Pieces of this hard Skin, which I had cut off at the thickeſt part of it, before a Microſcope, and moiſtened them with fair Rain-Water when I put them upon the Glaſs-plate, by which Means they acquired a great Extent; and being dried, they ſhrunk again, and thereby appeared in ſeveral long Particles, and each of them ſeemed to conſiſt of other long Particles, as they are repreſented in *Fig.* 62. So that AB or CD was the Thickneſs of that piece of thick Skin, which I had cut through. *Fig.* 62.

From this Obſervation, I conſidered with myſelf, whether one of theſe long ſtripe-like Particles, ſuch as appeared to the Eye at AC or BD, might not be the Thickneſs which the horny Skin had acquired in the Space of a Month; and whether the very thin Particles, which appeared in ſuch a little Stripe, were not the Accretion which the hard Skin received in one Day. This laſt mentioned little Piece was not ſo large to the naked Eye as a common Grain of Sand. And whereas I placed before a Microſcope another very ſmall piece of Skin, that was ſomething thinner than the former, I could perceive the exceeding thin Particles repreſented by *Fig.* 63. which were the *Strata*, or Beds, in which the horny Particles of the Skin lay, and ſo compoſed the Thickneſs thereof. *Fig.* 63.

For my further Satisfaction, I ſent for a Maſon's Servant, who was a laborious Workman, and cut out of his Hand, where it was moſt thick and brawny, two Bits of the hard Skin; and then I ſlit it into ſmall Slices, and obſerved eaſily enough the thin Particles lying upon each other, but could not ſeparate the little Scales, of which each little *Stratum* of the hard Skin conſiſted, becauſe, as I fancied, through the hard working of the Man, the Particles of the ſaid Skin were ſo preſſed upon one another, and ſo cloſely joined, that they could be no longer ſeparated.

As

As the Hands of the Maſons or Bricklayers are often covered with the ſharp Salts of the Chalk or Lime, we might prevent the Separation of the very ſmall Parts of the hard Skin; I ſent for a Maſter-Carpenter, who was likewiſe a diligent Workman, and viewing his Hands, in order to pare off ſome of the Brawn thereof, I found them as ſoft in the Palms, as if he had never been uſed to Labour; upon which I ſaid to him, you waſh your Hands very often, I believe; to which he replied, ten times a Day at leaſt, for I hate to ſee them foul. Then I ſent for a Ploughman, who was moſtly a Tiller of Corn-Land; this Perſon's Hands was very hard; I cut two pieces of horny Skin out of them, which after I had done, I cut them in little Bits, but they were ſo hard, that a ſharp Knife, got ſeveral Notches in doing it. And I obſerved that the uppermoſt part of the Skin was full of little Rents, and all the *Strata* were preſſed ſo cloſely together, that I could not make any Diſcoveries therein, ſave only that the little Beds lay on each other, and that the Thickneſs of the Skin conſiſted thereof.

I put the two pieces of hard Skin into warm Water, in order to ſoften them, and then to ſeparate the Parts from each other, but could not do it, becauſe they were ſo ſtrongly joined together.

I have ſeveral times obſerved, in waſhing my Hands, that when I rubbed the Palms of my Hands ſtrongly againſt one another, with very little Water between them, ſome Particles would be rubbed off from the Skin, and continue between my Hands.

For my farther Satisfaction in this Matter, I put one of my Fingers into fair Rain-Water, and with that waſhed the part of my Thumb which is joined to my Hand; after which I rubbed both Finger and Thumb hard againſt each other, then I gently ſcraped with a Pen-knife, the Matter, which I had looſened from the Skin by moiſtening and rubbing it; and taking off a little of that which ſtuck to the Knife, I put it upon a clean Glaſs-plate, and ſetting it before a Microſcope, I ſaw with Aſtoniſhment the great number of Particles of Skin, which lay ſcattered upon the Glaſs, but were more irregular than thoſe, which I ſeparated from the brawny Skin of my Foot, and which were not very cloſely preſſed together, becauſe I do not walk much.

After this I moiſtened the back of my Hands, and then rubbed them ten or twelve times againſt each other, and having ſo done, I ſcraped off, with a Pen-knife very gently, ſome of the Matter I had looſened by rubbing; and placing it on a clean Glaſs, I viewed it with a Microſcope, after having ſeparated the Particles of the ſaid Matter from each other with a little Water, and diſcovered abundance of little Scales which come off our Hands.

As the Skin of my Hand is in no part thicker than that, which is upon my Thumb next to the Nail, having in my advanced Age, chiefly uſed my Thumbs in the Examination of Microſcopical Objects, I made one

one of my Thumbs a little moiſt, and rubbed the other againſt it, and placed the rubbed off Matter before a Microſcope, through which I obſerved ſuch a prodigious number of Particles, like thoſe repreſented by *Fig.* 61 but all irregular, that no Man can conceive it without having ſeen it.

Now as we find that ſuch a Quantity of Particles is ſeparated from the Hands, and is daily renewed in a well conſtituted Body; we muſt conclude, that we eat ſeveral of the ſaid rubbed off Particles in our Bread, and that they turn to Nouriſhment; and I am of Opinion, that there is hardly any Food prepared for us, eſpecially ſuch as paſſes pretty much through the Hands, but that ſome of the rubbed off Particles are mixed therewith, eſpecially when they knead Dough from Meal or Flower; and ſtill more, when the Bakers knead with their Feet, as in making of Rye-Bread.

Since theſe Obſervations concerning rubbing of my Hands, I take more notice thereof, when I waſh and dry them, than formerly; and I ſtand amazed at the numerous Particles that daily ſeparate themſelves from my Hands, and grow on them again; and at the particular Proviſion, that is made for producing theſe Particles, in the Palms of our Hands and Bottom of our Feet, whereas we do not by far meet with ſuch a Quantity of Particles conſtantly produced in other Parts of our Body; for we obſerve thoſe, who work much with the back of their Hands, we ſhall not meet with any of that hard Skin we have been ſpeaking of, but only a kind of Tumor, or riſing, as the Dry-ſheerers, of thoſe who dreſs Cloth, have upon their left Hands.

The Manner of the Production of theſe ſmall Particles will be a Myſtery to us, though our Hands and Feet muſt be fortified with ſuch a Matter, to enable them to ſupport all that Force, and Preſſure, which they are obliged to undergo.

II. A Country Labourer, living not far from *Euſton-Hall* in *Suffolk*, ſhewed a Boy (his Son) about fourteen Years of Age, having a cuticular Diſtemper, of a different Kind from any hitherto mentioned in the Hiſtories of Diſeaſes. *An Extract from the Minutes of the* Royal Society, March 16, 1731, *containing an uncommon Caſe of a* Diſtempered Skin, *by* John Machin, *Secr. R. S. & Prof. Aſtr.* Greſh. No. 424. p. 299.

His Skin (if it might be ſo called) ſeemed rather like a duſky coloured thick Caſe, exactly fitting every part of his Body, made of a rugged Bark, or Hide, with Briſtles inſome Places, which Caſe covering the whole excepting the Face, the Palms of the Hands, and the Soles of the Feet, cauſed an Appearance as if thoſe alone were naked, and the reſt cloathed. It did not bleed when cut or ſcarified, being callous and inſenſible. It was ſaid he ſheds it once every Year, about Autumn, at which Time it uſually grows to the Thickneſs of three Quarters of an Inch, and then is thruſt off by a new Skin which is coming up underneath.

It was not eaſy to think of any ſort of Skin, or natural Integument, that exactly reſembled it. Some compared it to the Bark of a

Tree; others thought it looked like Seal-Skin; others like the Hide of the Elephant, or the Skin about the Legs of the Rhinoceros; and ſome took it to be like a great Wart, or Number of Warts uniting and overſpreading the whole Body. The briſtly Parts, which were chiefly about the Belly and Flanks, looked and ruſtled like the Briſtles, or Quills, of a Hedge-Hog, ſhorn off within an Inch of the Skin.

His Face was well featured, and of a good Complexion, if not rather too ruddy; and the Palms of his Hands were not harder, or in worſe Condition than is uſual for Workmen or Labourers. His Size was proper for his Age; his Body and Limbs ſtrait, and, excepting as to this Deformity, well ſhapen.

This rugged Covering gave him no Pain or Uneaſineſs, unleſs that ſometimes after hard Work, it was apt to ſtart and cleave, and cauſe a Bleeding. And notwithſtanding the unuſual Diſpoſition of his Humours to form ſo ſtrange an Integument, his natural Excretions were ſaid to be in the ordinary Courſe and Manner, without any thing remarkable attending them.

The Father knew of no Accident to account for this Diſtempered Habit. But ſaid, that his Skin was clear at his Birth as in other Children, and ſo continued for about ſeven or eight Weeks, after which, without his being ſick, it began to turn yellow, as if he had had the Jaundice; from which by degrees it changed black, and in a little time afterwards thickened, and grew into that State it appeared in at preſent. That he has been in Health from his Birth, and hath no Sickneſs at the Seaſon when he ſheds it. He further ſaid, that his Mother had received no Fright, to his Knowledge, whilſt ſhe was with Child; and hath born him many Children, none of which have ever had this, or any other unuſual Diſtemper or Deformity.

Fig. 64. *Repreſents the Back of the Boy's Hand.* Fig. 65. *Repreſents a Portion of this extraordinary* Epidermis, *which was probably a Prolongation of the Nervous* Papillæ, *grown to about the Size of common Twine Packthread; and theſe ſtanding as cloſe together as the Briſtles in a Bruſh, ſeemed, like them, to be all ſhorn off even, and of the ſame Length,* viz. *about half an Inch above the Skin.* Fig. 66. *Shews ſome of theſe Briſtles, or Stumps, magnified; where it is viſible that ſome of them are flat at Top, others concave; ſome pointed like a Cone, and others very irregular.*

Extract of ſeveral Letters and Certificates ſent the King, concerning a very par-

III. *Jeremias Rudolph von Walthauſen,* a Captain of the Garriſon at *Danneberg*, near *Lunebourg*, was born *Oct.* 24, 1680, with a very ſingular Mole upon his right Arm, Shoulder, and Hind-part of his Side, not unlike the Branch of a Vine, with it's Leaves and Grapes. It hath been affirmed and atteſted, both by the deceaſed himſelf,

himſelf, and ſeveral of his Relations and Friends, that his Mother, when big with Child, had an earneſt Deſire for Grapes, and impatient to ſtay, till they were full ripe, went down into the Garden to pull off ſome of thoſe unripe; whereupon it happened, that a whole Branch, with it's Leaves and Grapes, ſuddenly fell down upon her right Arm, which much frightened her. Some Time after ſhe was brought to Bed, and the Child was obſerved to have ſeveral reddiſh or bluiſh Spots, beginning from behind his Shoulder, and from thence running over the ſame, down the right Arm to the Fingers. The Captain's whole right Side was bigger than the left by an Inch and upwards, and ſo continued to his Death. The Veins of the right Arm were much raiſed, lying almoſt immediately under the *Cuticula*, which made them very conſpicuous, they were, beſides, very much diſtended, chiefly between the Elbow and Hand, where they were almoſt as big as a Man's Thumb. On the Inſide of the fore Finger the Vein was extended into a ſmall Tumour, of a reddiſh, or purple blue, Colour, about the bigneſs of a Nutmeg, corrugated with ſome lenticular Protuberances, which made it in ſome meaſure reſemble a Grape. The like Tumours, but not ſo big, were obſerved in ſeveral other Parts of the Arm, in the Spring Time; and, as they thought, when the Sap began to enter the Vines, as alſo when the Vines flowered, and, in *Autumn*, when the Wine was fermenting, the Captain was taken ill, with violent and itching Pains, in the affected Arm, for ſome Days. The whole right Side then ſwelled more than uſual, and the Veins and Tumours above-mentioned were ſo diſtended with Blood, that at laſt, a ſerous Matter was forced out of the Pores of the ſaid Tumours, which as it gave the Patient ſome Relief, ſo he promoted it, by ſcraping the Tumours with the Edge of a Penknife. If the Captain held up his affected Arm, the Running of the Blood backwards in the diſtended Veins was very viſible. If he held his Arm down again, the Blood returned with ſome Noiſe, and ſenſibly filled the Veſſels, which by the preceeding Action had been emptied. For this Reaſon, the Captain, when he was in Bed, was obliged to lay his Arm upwards. In *February* laſt, the Captain was again taken ill with the violent Pains, and a ſtrong ſenſible puſhing of the Blood into the affected Arm; for both which, they being not only more violent, but continuing longer than uſual, he was adviſed to be let Blood on his left Arm; as this did not immediately relieve him, they applied, at his Deſire, externally, *Epithemata* of Plants boiled in Wine; this eaſed his Pains, and made him ſomewhat more quiet, ſo that he could walk about the Houſe, but he nevertheleſs continued reſtleſs for ſome Days, and was, on *Saturday* the 17th of *February*, S. N. early in the Morning, ſeized with a violent Oppreſſion of his Breaſt, which in a few Minutes made an End of his Life. The Surgeon, then preſent, did not bleed him, but gave

ticular Nævus Maternus, *or* Mole. *Communicated by Dr* Steigertahl, *F. R. S.* No. 389. *p.* 347.

him only ſome ſpoonfuls of a ſtrong Cordial Mixture, which he happened to have about him, and of which the Patient, with much Difficulty, could ſwallow but a ſmall Part. He was, when he died, 44 Years, 3 Months, and 24 Days old; he was otherways a ſtrong robuſt Man, much given to Fatigue, and diſcharged with great Bravery all the Duties of a good Soldier, as appeared by his Conduct throughout the laſt War.

An Account of a Book, entituled Adverſariorum Anatomico-Medico-Chirurgicorum Decas tertia. *Auctore* Frederico Ruyſch, *M. D. Anatom. & Botan. Prof.* Amſtel. *R. S. S.* No. 379. *p.* 428.

IV. In § 8. He treats of the *Epidermis*, or Scarf-Skin, with a good Method of ſeparating it for publick Demonſtrations. He takes off a Piece of the whole Skin, and nails it upon a Board with the Outſide uppermoſt, and then puts it into boiling Water, which raiſes it ſo, that with a blunt Knife it is eaſily ſeparable, which is a much better Way, than that of burning and bliſtering. He ſays, the different Colours of the Skin are owing to the *Corpus Reticulare*, which in Blackmoors is perfectly black, in Moors of a tawny Colour, in white People perfectly white. The *Epidermis* is ever found abſolutely void of Blood-Veſſels: Upon which occaſion he charges Mr *St Andre*, with falſly aſſerting he has Preparations which ſhew theſe Veſſels, and has pretended to ſhow them to ſome of his Countrymen the *Dutch*. He adds, that he gueſſes the Occaſion of his Miſtake to be thus: The Skin of new-born Infants, in ſome certain Places, if it be carefully ſeparated from all Fat, is ſo fine and thin, that it becomes like the *Epidermis* in Adults. This no doubt is extremely full of Veſſels, and is what he has imagined to impoſe upon Mr *St Andre*.

CHAP. III.

The HEAD.

Obſervations on the Brains of three Perſons, who died of the Epilepſy, by Dr Walterus Curienſis Rhætus, No. 399. *p.* 315.

I. VIR 35. *Annorum*, temperamenti & habitûs gracilis, abhinc duobus annis correptus dolore gravativo capitis in parte anteriore verſûs frontem & à D. Profeſſoribus multa ac multa remedia accepit, ſed fruſtra: tranſactis duobus annis Hæmorhagia narium Larga contigit, quæ tamen ſpontè ceſſavit. Poſt Hæmorhagiam amiſit ſenſum olfactorium, & poſteà correptus fuit per duos annos *Paroxyſmis Epilepticis* ſæpiûs ingruentibus, denique mortuus eſt.

Secto cranio, vidimus Cerebrum in parte anteriore verſus *Duram Matrem* circà Regionem *Criſtæ Galli*, in parte dextrâ durum & calloſum, & arctiſſimè cum *Meninge durâ* connexum: in parte Cerebri anteriore

teriore verſùs ſiniſtram partem, inventa fuit extravaſatæ materiæ ſanguineæ aliqua quantitas, reliqua naturalia.

Anaſarcâ laborans Mulier 60 annorum vehementiſſimis iiſque ſæpè repetitis acerbiſſimis *Inſultibus* correpta obiit. Secto cranio, invenimus intrà *Piam Meningem* & Cerebrum, atque in anterioribus Cerebri ventriculis magnam ſatis extravaſatæ lymphæ quantitatem, ut eâ ventriculi fermè turgidi fuerint. In *Plexibus Choroideis* conſpectui ſeſe tradidere plurima corpuſcula albicantia, pellucida, ſerum aquoſum in ſe continentia, variæ magnitudinis; maxima ad magnitudinem ſeminis *Cannabini* majoris accedebant.

Diſſecto Cranio Vetulæ alicujus quæ per multorum annorum tractum. *Epilepſiæ* valdè obnoxia erat, vidimus intra *Piam Matrem* & Cerebrum, mediocrem Seri extravaſati copiam, in anterioribus autem Cerebri ventriculis tanta talis Seri quantitas fuit, ut crepaturam illorum quaſi minabatur. *Plexus Choroidæus* inſtar veri racemi apparebat uterque; veſiculæ inibi plurimæ, rotundæ, pellucidæ, & variæ magnitudinis nobis viſui ſeſe obtulêre, & inſtar elegantiſſimarum apparabant Perlarum.

II. 1. On the 13th of *July* in the Year 1720, he couched a *German* Soldier of Cataracts in both his Eyes, who immediately after the Operation recovered the Sight of both, and continued to ſee till his Death, which happened of an acute Illneſs, on the 6th of *April* this preſent Year. Upon this, Signor *Benevoli* took the Eyes out of their Orbits, in order to examine whether the Cataracts conſiſted of a membranous Pellicle, as ſome Writers maintain; or, as others pretend, of a preternatural Opacity in the Cryſtalline Humour. Upon a careful and very exact Examination of all the Contents of it, he could not find any ſuch thing as a Pellicle within it, but diſcovered a ſmall yellowiſh Body at the bottom of the Bulb of the Eye, of a lenticular Shape, without Adheſion to any of the other Parts of the Eye, which, upon taking it out, appeared to be the Cryſtalline Humour grown opake, and ſomething leſs than it's natural Size, having two or three ſmall Dents in it's Circumference, which it had received from the Needle during the Operation of couching.

An Account of a Letter from Sig. Antonio Benevoli *to Dr* Valſalva, *containing two Obſervations upon Cataracts, printed in* Italian *at* Florence. 1722. N°. 393. p. 194.

The next Day he examined the right Eye in the ſame manner, in the Preſence of ſeveral eminent Phyſicians and Surgeons, and other curious Perſons, whom he had invited to the Demonſtration, and found in it the Cryſtalline grown opake and depreſſed in the ſame manner as the former, to the bottom of the Eye, ſtill carrying the Marks of the Needle evidently upon it, but found no Pellicle within the Eye, notwithſtanding the moſt diligent Search he could make for it. He farther relates, that having formerly made Experiments upon the Eyes of dead Subjects; he had introduced the Needle into the Eye in the ſame Place, and in the ſame Manner, as is commonly practiſed in the Operation of couching, and having afterwards diſſected the ſame Eyes, he had always found, that the Needle had paſſed

into the Eye on the back ſide of the Cryſtalline Humour, ſo that it had been impoſſible to bring the Needle forward from thence into that Part of the aqueous Humour, which is ſeated between the *Uvea* and the Cryſtalline Humour, in order to depreſs a Pellicle ſeated there, according to the common Opinion, unleſs he would have paſſed his Needle through the Body of the Cryſtalline.

He likewiſe obſerves, that the aforeſaid Space, between the *Uvea* and the Cryſtalline Humour, is ſo very narrow, that though he finds it not impoſſible to introduce a Needle into that Space, yet there is by no means room enough to turn the Needle up and down in all Directions, with that Freedom, that is uſed in couching Cataracts, without wounding either the *Uvea*, or the Cryſtalline.

Laſtly, He obſerves, that in his Practice of couching Cataracts for many Years, having generally couched about twelve or fourteen in a Year, he had always found, that he worked upon a hard and reſiſting Subſtance, which being tenderly touched by the Needle, would vibrate and fluctuate backwards and forwards, and would ſometimes return againſt the Needle with a ſenſible *Impetus*, which by no means agrees with the common Notion of the Cataract's conſiſting in a Pellicle or membranous Subſtance.

Of the Diſſection of an Eye with a Cataract. By Mr John Ranby, *Surgeon.* N°. 381. p. 36.

2. *Sept.* 21, 1723, I was conſulted by one *William Sollars*, aged Fifty, who complained of a Decay in his Sight; upon examining his Eyes, I found two Cataracts, that in his right Eye almoſt ripe, the other juſt forming. There being no other obvious Method of relieving him, I propoſed the Operation, but firſt adviſed him to conſult ſome others of the Profeſſion, and accordingly he adviſed with Mr *Tanner*, who upon viewing his Eyes, declared them both Cataracts, but neither of them as yet was fit for the Operation. In the mean time the poor Man fell ill of a Fever, and died the 2d of *March*. I procured the right Eye, in which the Cataract was moſt confirmed, in order to make an exact Diſſection of it: In examining it, I found the Aqueous and Vitreous Humours in their natural State, but the Cryſtalline was opake and of a foul Pearl Colour, and more ſolid Subſtance than in it's natural State. The generally received Opinion, that a Cataract is a Film growing behind, or ſometimes before the Pupil, made us examine both Chambers of the Aqueous Humour, with the utmoſt Exactneſs. but all to no Purpoſe, for the Aqueous Humour had it's natural Tranſparency, nor could we obſerve any thing preternatural either on the *Iris* or *Uvea*, except too great a Contraction of the Pupil. This very much ſtrengthens the Opinion of *Maitrejan*, *Briſſe*, *Heiſter*, and *Valſalva*, who have ſeverally aſſerted, that a Cataract is only an Opacity of the Cryſtalline Humour; and that it naturally proceeds from a ſerous Acid, which ſo far aſtringes and corrodes it's Subſtance as to deſtroy it's Tranſparency. This, *Maitrejan* confirms by an Experiment of emerging the Cryſtalline Humour in a Compoſition of three Parts Water and one of *Aquafortis*, by which he tells us it may be

be rendered hard and opake; but in this Point I cannot help ſiding with the learned Dr *Pitcairn*, who has ſufficiently proved, that there is no ſuch ſerous Acidity in an animal Body. To me nothing ſeems more eaſy than to deduce this Opacity of the Cryſtalline Humour from an Inflammation in the Blood, or an increaſed *Momentum* in the Fluids, with which it is ſupplied: For in that Caſe groſſer Particles, inconſiſtent with the Tranſparency, may be impelled into the Lymphatic Veſſels of which it is compoſed; and that there is an Inflammation is ſufficiently demonſtrated from hence; firſt, the Patient feels often a pungent Pain in the Eye, which as it is generally the forerunner of a Cataract, ſo it certainly indicates an Inflammation of the Part. Secondly, Thoſe *Maculæ*, which appear as it were ſwimming in the Air, plainly prove that there are opake Particles already entered the Lymphatic Veſſels, which compoſe the Vitreous Humour.

Thirdly, the *Iris*, whoſe Colour ariſes from the Blood Veſſels, as it changes from a lighter to a darker Colour, ſhews the Violence of the Inflammation, and is therefore eſteemed a Symptom of the worſt Conſequence.

Two Eyes with Cataracts diſſected. Communicated by Samuel Molyneux, *Eſq*; *F. R. S.* N°. 384. p. 149.

3. *Johannes Wright*, ſenex mileſque emeritus, ſuffuſione ſeu Cataractâ utriuſque oculi laborans, viſu tandem omnino privatus eſt. Curæ ſe commiſit Domini *Caywood*, Oculiſtæ *Dublinienſis*, qui acu punctoriâ oculum utrumque perforavit ad Cryſtallinum è ſede ſuâ deprimendum. Operatione verò in oculo dextro minus feliciter ſuccedente, ſiniſtri uſum ſolummodo recuperavit. Paucis menſibus poſt operationem peractam, in hoſpitium regale militum emeritorum prope *Dublinium* receptus eſt, ubi per annos octo vel novem manſit, &, per totum iſtud tempus, viſus aciem ſatis acutam habuit, adeo per urbem ſolus ambularet, & ſodalium facies diſtinguere poſſet. Mortuus eſt tandem 5° die Aprilis 1722. ſuffocatus per caſei morſulum hærentem in gula, quam adeo arctam habuit, ut eundem mortis aditum paucis abhinc annis bis ægre evaſerit: Oculi ejus, e cranio exempti, miſſi ſunt per Noſocomii Chirurgum ad *Thomam Molyneux* Medicinæ Doctorem, Collegii Med. Regalis in *Hibernia* Socium, & in Academia *Dublinienſi* Medicinæ Profeſſorem. In ædibus ejus cultro Anatomico aperti ſunt, per Oculiſtam ſupradictum, meque, ut intereſſem operationi, accerſere dignatus eſt. In oculo ſiniſtro (cujus aciem recuperatam fuiſſe ſupra notavimus) ſublatâ corneâ cum portione tunicæ ſcleroticæ, ne vel minimum invenimus rudimentum pelliculæ in aqueo humore fluctuantis, aut limbo iridis adnatæ, ſicut ſe obſervaſſe ſcribit *Wolhouſius*. Quod vero multo magis mirandum eſt, nullæ prorſus reliquiæ inventæ ſunt humoris Cryſtallini, cujus opacitati morbum adſcribit Doctor *Briſſeus*. Humor Vitreus, quoad ſitum & conſiſtentiam, nihil præternaturale oculis noſtris exhibuit; tunica choroidea & retina fuſci coloris erant tam intus quam extra. In oculo dextro eadem omnia obſervavimus; nullum nempe pelliculæ aut Cryſtallini rudimentum

tum occurrebat. Tunica cornea rugoſa erat & flaccida, quod aqueus humor per puncturam extravaſatus, numquam renovatus ſit: adeoque iſtius oculi uſum amiſit penitus. Cryſtallini vero defectum quod attinet, res eſt prorſus inaudita, neque ab ullo Anatomico, quantum ſcio, defuiſſe obſervatus eſt, vel leviter ſuſpectus. Militem hunc Cryſtallinum habuiſſe in utroque oculo ante operationem, nullus dubito; cum vero acu a ſede ſua detruſus eſt, ligamentis ciliaribus vaſiſque, quibus nutrimentum hauſit, penitus diſruptis, eum ſenſim contabuiſſe credo, tandemque in auras diſſipatum fuiſſe. Summopere vellem hanc rem experimento ſæpius iterato confirmatam eſſe: ſuſpicor enim idem ſemper evenire ſtato tempore poſt depreſſum Cryſtallinum.

Hoc certo conſtat ex hac hiſtoria, hominem nempe abſque Cryſtallino videre poſſe, contra opinionem *Wolhouſii*, eâque amplius confirmatur ſententia D. Doctoris *Briſſei* de Cataracta.

Of the Subſtance of a Cataract, by Dr. WalterusCurienſis Rhætus. N° 399 *pag.* 317.

4. Vetula circiter 50 annorum, dum viveret, ſiſtebat *Cataractam veram* in oculo ſiniſtro, Coloris *Perlacei*, magnitudine mediocri, ità tamen ut aliquantiſper pluſquàm dimidiam, eamque mediam *Pupillæ* partem occupabat, vidi manifeſtè eam Cataractam retrò *Uveam*, & in 2dâ oculi Camerâ eſſe ſuſpicabar. Interrogatus à *Santorino*, in præſentiâ decem plùs minùs Medicorum, quid judicium meum ſit de hâc *Cataractâ*, an ſit *Cuticula* vel *Cryſtallini* vitium? reſpondi, me potiùs pro *Cuticulâ* habere quam pro *Cryſtallini* vitio, attamen id abſolutè & indubiè affirmare nolle, quoniam ſignum Pathognomonicum non datur. Reſpondenti mihi ridere cœpit, quod audeam aliquid de *Cuticulâ* ſive *membranulâ* ſtatuere, perſuaſus enim eſt ipſe, *Heiſteri Syſtema* certum eſſe *&c. Mortuâ diſſectâ*, *Cryſtallinus humor* erat pellucidus quibuſvis inſtitutis experimentis, neq; ullâ maculâ aut minima obfuſcatione imbutus; erat equidem per totam ipſius molem ubique & æqualiter leviſſimè, citrino Colore perfuſus, vix namque aliquid hujus Coloris apparebat, in vivis adhuc exiſtente Vetulâ. *Cuticula* eadem Libera in nominatâ Camerâ exiſtebat, & non niſi duâbus ſubtiliſſimis fibrillis *Uveæ* adhærebat: *Pupilla* naturali quoque aliquantulum major reperta.

A partial Sight of Objects, by Abraham Vater, Prof. Med Wittemb. F. R. S. N° 384. p. 147.

III. Fæmina mediæ ætatis, anno ſuperiori, a retro-pulſa, par balneum, & ſubſecutam refrigerationem, Coryza, unica nocte incidit in cataractam nigram, ſeu guttam ſerenam: nam mane e ſomno experrecta, uſu oculorum orbatam ſe ſentit, nullo extrinſecus in oculis vitio apparente. Poſt uſurpata vero medicamenta varia laxantia & ſanguinem purificantia, interpoſitis ſimul veſicatoriis, una cum decenti Diæta, viſus ſenſim rediit ita tamen ut notatu dignæ viſus viciſſitudines, ac ſingularia in eo phænomena occurrerent. Primum enim omnes ipſi obvios homines, capite quaſi truncatos vidit, ſolo corpore abſque capite in oculos incurrente. Succeſſu temporis, ceſſante hac obſervatione, objecta quidem tota, ſed quaſi per nebulam aut per rete vidit, & hoc ceſſante, maculas tamen & flocculos oculis obverſari percepit. Tandem affectus hic in viſum partialem, quo hoc ipſo tempore adhuc laborat, degeneravit. Nunc enim, utroque oculo aperto, & verſus objectum

jectum directo, illud quidem totum conſpicit : alterutro vero eorum clauſo, pars objecti, macula aut nebula rotunda tecta, videtur, quæ macula tanto major apparet, quo longius oculus ab objecto removetur. Prout autem oculus ſive dexter, ſive ſiniſter, occluditur, ſemper quidem media objectorum pars, at diverſa, obſcuratur. Ita ſi, exempli gratia, has tres voces in charta ſcriptas (*Ego ſum cæca*) intueatur oculo ſiniſtro tantum, pupilla verſus mediam vocem *Sum* directa, hæc in viſum non incurrit, ſed tantum duæ voces *Ego* —— *cæca* conſpiciuntur. Pupilla vero verſus vocem *Ego* directa, hæc evaneſcit, ita ut tantum —— *Sum cæca* videat. Quod ſi e contrario oculum ſiniſtrum claudat, & oculum dextro inſpiciat objectum, tunc medium quidem pariter obſcuratur, ita tamen, ut tantum pars quarta viſum fugiat, tribus partibus clare conſpectis. Ita ſi, exempli gratia, oculo huic objiciat has quatuor voces, in charta ſcriptas, (*Ego opto eſſe ſana*) tunc pupilla ad medium directa, omnes voces videt, præter vocem *opto*, quæ macula itidem rotunda obſcuratur, & videt ægra ita tantum, *Ego eſſe ſana*. Quoniam ergo ex hoc caſu apparet, maculam illam rotundam, qua pars objecti obſcuratur, eſſe fixam quidem, ſed pro varia pupillæ directione locum mutare, dubium videtur, utrum vitium in humore cryſtallino, an in tunica retina hæreat? In tunica quidem cornea nulla obſcuritas aut macula patet. Majoris vero momenti, ac explicatu difficilius videtur antecedens phœnomenon, ubi ægra totum hominis corpus, excepto tantum capite, conſpexit.

Obſervations made by a young Gentleman, who was born blind, or loſt his Sight ſo early, that he had no Remembrance of ever having ſeen, and was couched between 13 and 14 Years of Age, by Mr W. Cheſſelden, *F. R. S.* No. 402. p. 447.

IV. Though we ſay of the Gentleman that he was blind, as we do of all People who have ripe Cataracts, yet they are never ſo blind from that Cauſe, but that they can diſcern Day from Night ; and for the moſt Part in a ſtrong Light, diſtinguiſh Black, White, and Scarlet ; but they cannot perceive the Shape of any thing ; for the Light by which theſe Perceptions are made, being let in obliquely thro' the aqueous Humour, or the anterior Surface of the Cryſtalline (by which the Rays cannot be brought into a *Focus* upon the *Retina*) they can diſcern in no other Manner, than a ſound Eye can thro' a Glaſs of broken Jelly, where a great Variety of Surfaces ſo differently refract the Light, that the ſeveral diſtinct Pencils of Rays cannot be collected by the Eye into their proper *Foci* ; wherefore the Shape of an Object in ſuch a Caſe, cannot be at all diſcerned, though the Colour may : And thus it was with this young Gentleman, who though he knew theſe Colours aſunder in a good Light ; yet when he ſaw them after he was couched, the faint Ideas he had of them before were not ſufficient for him to know them by afterwards ; and therefore he did not think them the ſame, which he had before known by thoſe Names. Now Scarlet he thought the moſt beautiful of all Colours, and of others the moſt gay were the moſt pleaſing, whereas the firſt Time he ſaw Black, it gave him great Uneaſineſs, yet after a little Time he was reconciled to it ; but ſome Months after, ſeeing by Accident a Negroe Woman, he was ſtruck with great Horror at the Sight.

When he firſt ſaw, he was ſo far from making any Judgment about Diſtances, that he thought all Objects whatever touched his Eyes, (as he expreſſed it) as what he felt, did his Skin; and thought no Objects ſo agreeable as thoſe which were ſmooth and regular, though he could form no Judgment of their Shape, or gueſs what it was in any Object that was pleaſing to him: He knew not the Shape of any Thing, nor any one Thing from another, however different in Shape, or Magnitude; but upon being told what Things were, whoſe Form he before knew from feeling, he would carefully obſerve, that he might know them again, but having too many Objects to learn at once, he forgot many of them; and (as he ſaid) at firſt he learned to know, and again forgot a thouſand Things in a Day. One Particular only (though it may appear trifling) I will relate; having often forgot which was the Cat, and which the Dog, he was aſhamed to ask; but catching the Cat (which he knew by feeling) he was obſerved to look at her ſtedfaſtly, and then ſetting her down, ſaid, So Puſs! I ſhall know you another Time. He was very much ſurprized, that thoſe Things which he had liked beſt, did not appear moſt agreeable to his Eyes, expecting thoſe Perſons would appear moſt beautiful that he loved moſt, and ſuch Things to be moſt agreeable to his Sight that were ſo to his Taſte. We thought he ſoon knew what Pictures repreſented, which were ſhewed to him, but we found afterwards we were miſtaken; for about two Months after he was couched, he diſcovered at once, they repreſented ſolid Bodies; when to that Time he conſidered them only as Party-coloured Planes, or Surfaces diverſified with variety of Paint; but even then he was no leſs ſurprized, expecting the Pictures would feel like the Things they repreſented, and was amazed when he found thoſe Parts, which by their Light and Shadow appeared now round and uneven, felt only flat like the reſt; and asked which was the lying Senſe, Feeling or Seeing?

Being ſhewn his Father's Picture in a Locket at his Mother's Watch, and told what it was, he acknowledged a Likeneſs, but was vaſtly ſurprized; asking, how it could be, that a large Face could be expreſſed in ſo little room, ſaying, it ſhould have ſeemed as impoſſible to him, as to put a Buſhel of any thing into a Pint.

At firſt he could bear but very little Sight, and the Things he ſaw, he thought extreamly large; but upon ſeeing Things larger, thoſe firſt ſeen he conceived leſs, never being able to imagine any Lines beyond the Bounds he ſaw; the Room he was in he ſaid, he knew to be but part of the Houſe, yet he could not conceive that the whole Houſe could look bigger. Before he was couched, he expected little Advantage from Seeing, worth undergoing an Operation for, except reading and writing; for he ſaid, He thought he could have no more Pleaſure in walking abroad than he had in the Garden, which he could do very ſafely and readily. And even Blindneſs he obſerved, had

this

this Advantage, that he could go any where in the Dark, much better than thoſe who who can ſee; and after he had ſeen, he did not ſoon loſe this Quality, nor deſire a Light to go about the Houſe in the Night. He ſaid, every new Object was a new Delight, and the Pleaſure was ſo great, that he wanted Ways to expreſs it; but his Gratitude to his Operator he could not conceal, never ſeeing him for ſome Time without Tears of Joy in his Eyes, and other Marks of Affection: And if he did not happen to come at any Time when he was expected, he would be ſo grieved, that he could not forbear crying at his Diſappointment. A Year after firſt ſeeing, being carried upon *Epſom Downs*, and obſerving a large Proſpect, he was exceedingly delighted with it, and called it a new Kind of ſeeing. And now being lately couched of his other Eye, he ſays, that Objects at firſt appeared large to this Eye, but not ſo large as they did at firſt to the other; and looking upon the ſame Object with both Eyes, he thought it looked about twice as large as with the firſt couched Eye only, but not double, that we can any Ways diſcover.

V. *Fig.* 67 and 68, repreſent the Figures of two Eyes, on which a new Operation was performed, by making an Inciſion through the *Iris*, which had contracted itſelf in both Caſes ſo cloſe, as to leave no Pupil open for the Admiſſion of Light. *An Explication of the Inſtruments uſed in a new Operation on the Eyes, by the ſame.* N°. 402. p. 451. *Fig.* 67 & 68.

The Perforation in the Eye, *Fig.* 67, was made a little above the Pupil, the cloſing of which enſued upon the putting down a Cataract, which not knowing how low it might be lodged, I made the Inciſion a little higher than the Middle, leſt any Part of it ſhould lie in the Way.

The Eye, *Fig.* 68, was one I couched not long before, where the Patient had been blind but a few Years. At firſt he thought every Object further from him than it was; but he ſoon learned to judge the true Diſtance, the Cauſe of which I ſhall endeavour to explain by *Fig.* 69, in which let the Circle A, B, C, repreſent the Eye, A the *Fig.* 69. the Place where an Image through the natural Pupil B was repreſented from the Place E; now the artificial Pupil being at the Place C, the Object at D is now painted at the Place A, where the Object E was alſo to be perceived; therefore it was, I ſuppoſe, that the Patient miſtook the Place D for the Place E.

Fig. 70, Is a ſort of Needle with an Edge on one Side, which be- *Fig.* 70. ing paſſed through the *Tunica Sclerotis*, is then brought forwards through the *Iris* a little farther than F. This done, I turn the Edge of the Needle, and cut through the *Iris* as I draw it out: The Handle of this Needle is half black, and half white, which though it is not of much Uſe in this Operation, is very much ſo in couching Needles, we being thereby able to judge of their Poſition, when we do not ſee them.

Fig. 71, Is an Inſtrument to keep open the Eye-lids. G is a Bit of *Fig.* 71. Iron, which as it is moved backward, or forward, the Inſtrument opens and cloſes.

A prodigious Swelling of the Eye, by Mr Jac. Theod. Klein, *F.R.S.* N°.426 p.429.

VI. *Fig.* 72, is a Draught is of a prodigious Swelling of the Eye of a Subject of the Princeſs of *Radzivil.* This Swelling was occaſioned by Hail; and it daily encreaſes and grows hard, except at the Place marked by the Letter *a.* This Circumſtance is very ſingular, that the Optic Nerve, and the Tunicles have ſtretched ſo much, that the Eye quitted it's Socket, and fell down to the Beard, Letter *b.* The unhappy Man is ſtill living, and can move this Eye, which weeps, but, as is no Wonder, cannot ſee with it. The Tumour is not painful, but it is very troubleſome to him about his Noſe.

A vaſt Quantity of Matter running out of the Mouth of a Boy, and cauſing a rottenneſs of the Cheek-bone, &c. *By* Peter Hardiſway, M.D. N°.400. p. 374.

VII. *Feb.* 16. 1724. Advocabar ad Puerulum decennem, qui à ſex ſeptimanis febre lentâ decumbebat malè multatus. Præſcriptis quæ res poſtulabat remediis, intrà ſex vel ſeptem dierum ſpatium à morbo liber evaſit: Verùm diebus aliquot elapſis, ingens in Genæ dextræ interioribus ſubortus eſt Tumor, puero nihilominùs, quoad cætera benè valente. Ore ejùs ægrè diducto, in conſpectum veniebat ingens Puris quantitas; at unde manaret, præ Pueri protervia non licuit pro hâc vice explorare. Ideò conſulebam tantùm, ut ficum in lacte coctam ad tumorem emolliendum, atque ſi fieri poſſet rumpendum admoverent. Mane ſequenti Os incredibili ferè puris copiâ, teterrimi odoris (tumore intereà diſrupto) diffluebat. Gargariſmate modicè detergente præſcripto, circà veſperum pus pari omninò quantitate atque priùs depluebat. Mirabar ſanè unde hoc provenire poſſet, cùm Ulcus in Genâ tanto proventui nequaquàm ſufficere videretur; ſuſpicabar autem (fœtore præ cæteris ſuadente) materiæ iſtius fontem in capite alicubi intrà oſſa latitare: quod cùm paulò diligentius inveſtigarem, ecce *Os Maxillæ ſuperioris ad dextras* carne (quæ quaſi ſemicocta utrinque receſſerat) denudatum prorſus atque *Carie* correptum, & ex *Dentium Alveolis* (dentes enim puerulus, ceu inutiles, ſuis nullo negotio jam extraxerat digitis) hoc materiæ purulentæ profluvium jugiter delabi: quapropter Chirurgus è viciniâ advocatus eſt, cui committebatur negotium. Huic ſuadebam, ut dum *Oſſis* medelæ incumberet, *Ulceris* itidem deterſioni & conſolidationi operam daret; verùm quicquid dicerem, nulla quæcunque Genæ ſuppuratæ adhibere voluit medicamina: quò factum eſt, ut ea iterum in molem ingentem, atque alterâ (ſiniſtrâ ſc.) duplò major citò excreſceret. Mandibulæ Carioſæ ſolummodò penicillum tincturâ quâdam, forſan *Myrrhæ*, imbutum applicabat. At longo temporis ſpatio tandem emenſo, cùm parùm ſuâ tincturâ proficerit, hamulo admoto, quod temporius factum debuerat, *Os Mali* integrum evellebatur. Ab Oſſis extractione Gena nequicquàm ſubſidebat, ſed potiùs incrementum ſumebat, & materiæ purulentæ copia nullatenùs minuebatur. Oſſe autem abrupto, *Oſſis Palati* dimidium cum *Narium Septo* abſumptum eſt; parte etiam infimâ *Orbitæ oculi* ſimul abreptâ, ut in Iconibus adjectis clariùs oſtendere ſim conatus. His addendum, quod Tumore *Proceſſui Zygomatico* ſuperſtiti incumbente, *Gena* mole duplò inſignior *ſiniſtrâ* extat, & oculum pœnè claudit, pure quaſi ex fonte perenni indeſinenter fluente.

Fig. 73.

Fig. 61.

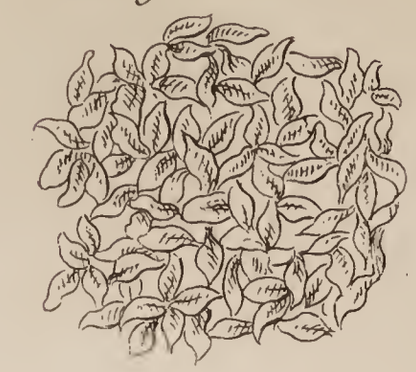


Fig. 62.

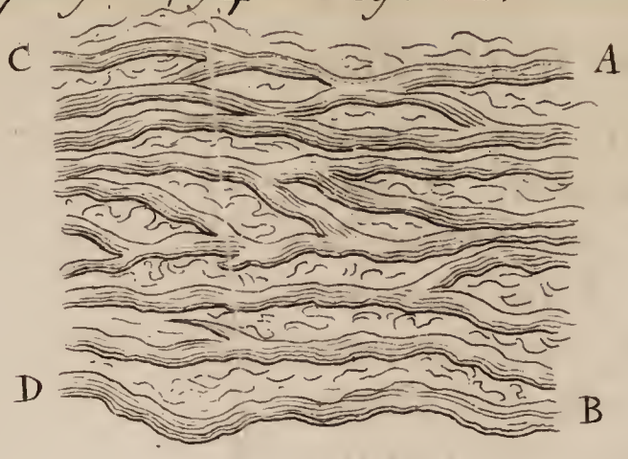


Fig. 63.

Fig. 65.

Fig. 64.

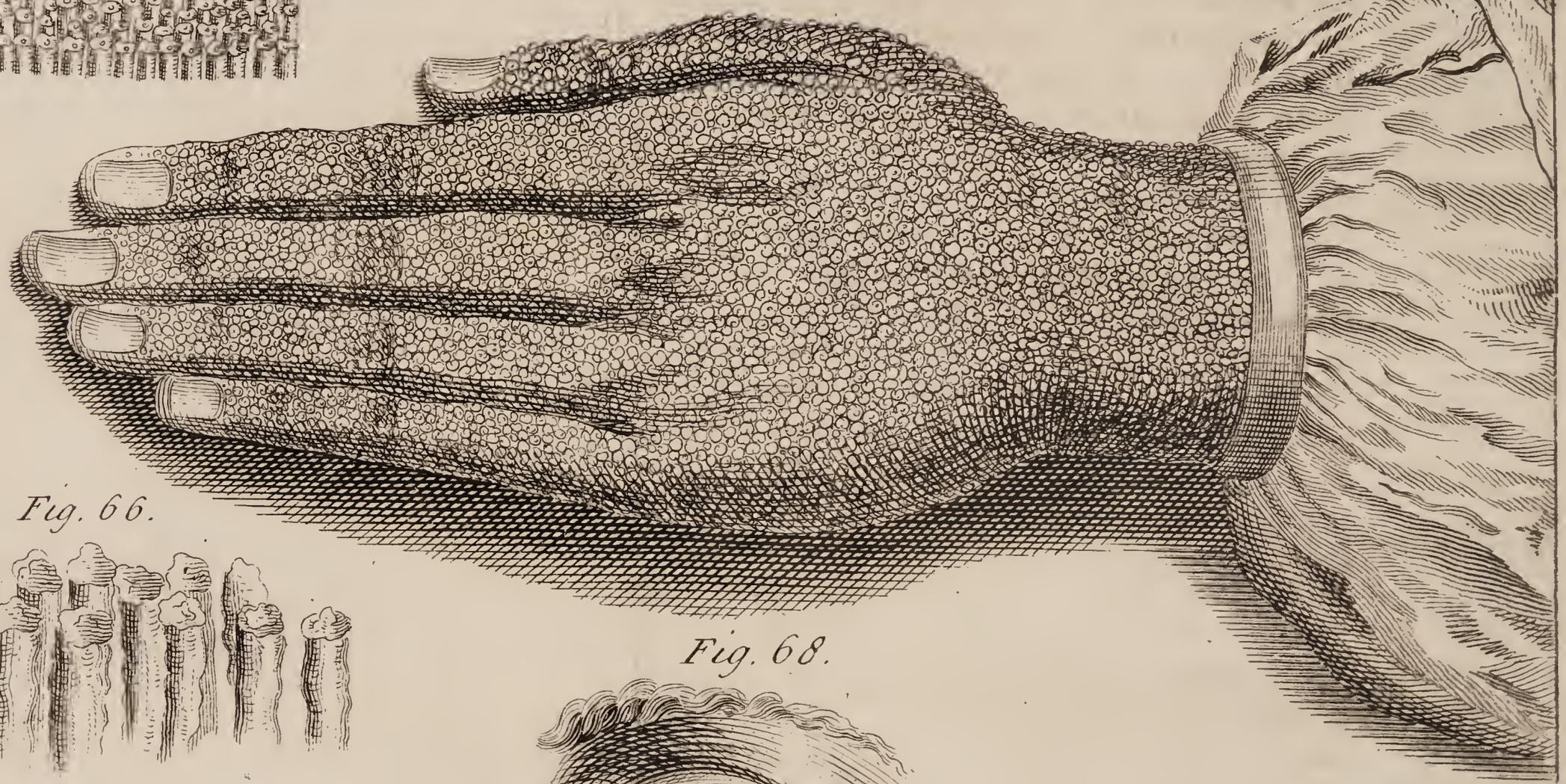


Fig. 66.

Fig. 68.

Fig. 67.

Fig. 69.

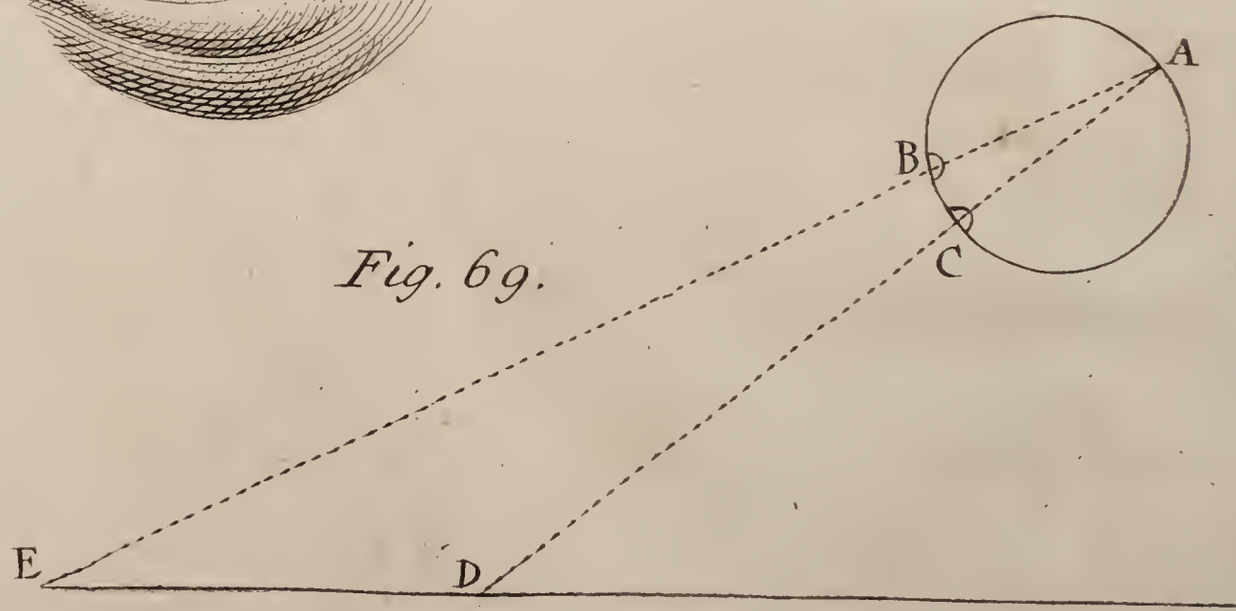


Fig. 73. Facies Offis externa. a, a, a, a, a, *Alveoli* Dentium. b Dens *molaris* remotior. c. Pars *Orbitam* oculi faciens. d. Pars Offis ubi abruptum circà *Naſum.* e. Pars Offis ubi *Proceſſus Zygomaticus* terminatur. f. Pars Offis ſub *Labium ſuperius.* *Fig.* 73.

Fig. 74. Forma interior Offis. 1 Pars ad *Naſum* abrupta. 3 Pars *Mandibulæ* exterior & Dentis *alveolos.* 4 Pars Offis *oculum* attingens. 5 Pars *Maxillæ* remotior. 6 Pars *Naris dextræ*, *ſepto* abrupto. 7 Dens *Molaris.* *Fig.* 74.

Fig. 75. Os reſupinatum exhibit. D, D, D, D. Pars *Offis Palati.* E, E, E, Alveoli dentium. F, F. Pars *Mandibulæ exterior.* G. Pars *anterior* ejuſdem. H. Dens Molaris. *Fig.* 75.

Fig. 76. Facies interior Offis parùm reclinati. A, A, A, A. Pars *Mandibulæ*, & *Alveoli* Dentium. B. Locus ubi os abruptum circà *Naſum.* C. Pars Offis *oculum* attingens. D. *Maxillæ* pars remotior. E. *Dens Molaris* remotior. F. Pars *Offis Palati.* G. Pars *Naris dextræ ſepto* abrupto, ut in Fig. 74. N° 6. *Fig.* 76.

Poſt hæc, idem per Literas die 24. Decemb. 1727. datas *Editorem* certiorem fecit. " Tumorem ſupra deſcriptum in eodem adhuc re-
" manere ſtatu, Materiâ Puriformi Os & Fauces prò ſolito irrigante.
" Puer cætera ſanus edit, bibit, dormit, & unà cum aliis ſuæ ætatis
" quotidiè alacriter ludit.".

A remarkable Plica Polonica, *by* Abr. Vater, M. D. *Prof. Anat.* Witremberg, *F. R. S.* No. 417. p. 50. *Fig.* 77.

VIII. 1. Fœmina ruſtica in Polonia, in terris Principis Radzivil, anno ætatis 15°, viro nupta, incidit 18°, in morbum Poloniæ Endemium, qui Plica Polonica a capillo inenodabili vocatur. Hanc Plicam per 50 annos fœmina geſtavit, ac per totum fere illud tempus dolore arthritico contracturis tandemque maraſmo univerſali corporis afflicta tecto affixa fuit, tandemque ſenio confecta anno ætatis 78 diem ſuum obiit. Fœminam iſtam adhuc viventem vidit non tantum, & ad vivum depingere curavit, ſed ipſam Plicam poſt obitum reſectam ſecum Wittebergam attulit D. Flouricke dicti Principis Medicus. Erat autem Plica quatuor ulnas longa, palmum lata duoſque pollices craſſa, ſed altero tanto longior foret, ipſo referente, niſi magna ejus pars, temporis quo ægra decubuit diuturnitate, ſqualore & attritu conſumpta fuiſſet.

A farther Account of the ſame, by Mr Jac. Theodor. Klein, *F. R. S.* No. 426. p. 428. *Fig.* 78.

2. This ſtupendous *Plica Polonica*, was ſent to *Dreſden*, where I ſaw it. It is remarkable, that the Woman affected with it, who lived in the Diſtrict of *Novogrod*, during 52 Years that ſhe laboured under it, never changed her Reſting Place but twice a Year, *viz.* in Spring and Winter. Upon the Approach of Winter ſhe could endure Cold ſo very well, that ſhe ſhunned all Sort of Heat, even that of a lighted Candle. She never uſed any ſtrong Liquor, but lived on very bad Bread, raw Herbs, and Water, to 70 Years of Age. In the Spring ſhe uſed to be carried to ſome Place where the Heat could not eaſily penetrate. She at length died, near two Years ago *.

* *This is dated* July 4. 1730.

3. The

Of the Cauſe of the Plica Polonica, *tranſlated from the* High-Dutch, *by Sir* Conr. Sprengell, *M. D. F. R. S.* No. 417. p. 51.

3. The *Plica* has been always thought to be a Diſtemper, and to proceed from a Fever or Convulſions; but for my Part, from the beſt Information I could get concerning it, I think it a Product of Naſtineſs, by not combing their Hair, nor waſhing their Heads; for if it were a real Diſtemper, the People of Faſhion could no more be free from it than the ordinary People, among whom it only happens. This is confirmed by the following Article in the *Tranſactions* of the Society of *Breſlaw*, entituled Sammlung von Natur. &c. *Anno* 1724, *Artic.* 17, *Menſe Auguſto*, p. 126.

" The great Multitude of People in *Poland*, who are troubled with " this *Plica*, firſt made me reflect, whether it were a real Diſeaſe or " no? But I am now convinced, that their ſwiniſh way of living, and " the common Opinion ſo deeply rooted in the Generality of People, " that this Lock of Hair cannot be taken off without Danger of their " Lives, have contributed more to this Complaint than any real In- " diſpoſition of Body; conſidering that it is the middling or poor " People, who are troubled with it; whom then one cannot look on " without Horror: But no *German*, of whom great Numbers live in that " Country, ever had any ſuch thing grow. Many of them, who are " married to Women of *Poliſh* Birth, are ſcarce able to perſwade their " Wives not to train up their Children to this Naſtineſs. Not long " ſince I ſaw a Fellow in the Church, who had about ſeventy of ſuch " Locks hanging down from his Head, which were as hard twiſted, " as ſo many Penny Cords; that one might eaſily have taken his for " for a *Meduſa*'s Head; and who knows, but that, in ancient Times, " ſome ſuch Locks as theſe might have given Riſe to the Poetical " Fiction of Snakes growing on the Head inſtead of Hair? Be that " as it will, this is certain, it is a moſt odious Sight."

Account of a Book, entitled, Adverſariorum Anatomico-Medico-Chirurgicorum Decas tertia. *Auctore* Fred. Ruyſch, *M. D. Anat. & Bot. Prof.* Amſtel. *R. S. S.* No. 379. p. 428.

IX. The Author tells us, he firſt found out the Fabrick of the cortical part of the Brain; that it is made of ſmall pulpy Canals from the End of the Arteries.

CHAP. IV.

The NECK and THORAX.

Account of the Operation of Bronchotome, *as it was performed at* St Andrews, *by* George Martin, *M. D.* No. 416. p. 448

I. A Young Lad being in a good State of Health, was all of a ſudden taken ill with a violent Trouble in his Throat; in which however, I could ſee nothing wrong, the *Amygdalæ*, and other Parts in view, being in all Appearance ſound enough, but only looking a little drier than ordinary; without any external Tumour appearing about the *Larynx*, and no conſiderable Frequency or Strength in his Pulſe. But he had great Pain and a *Dyſpnœa*, with an Impoſſibility of ſwallowing

Fig. 70.

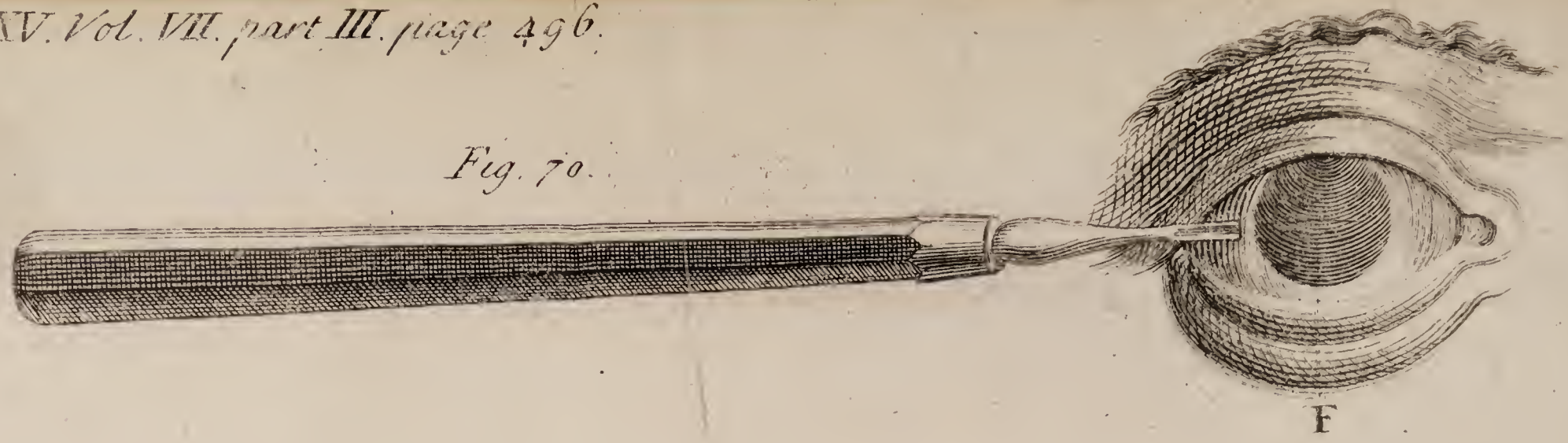


Fig. 71.

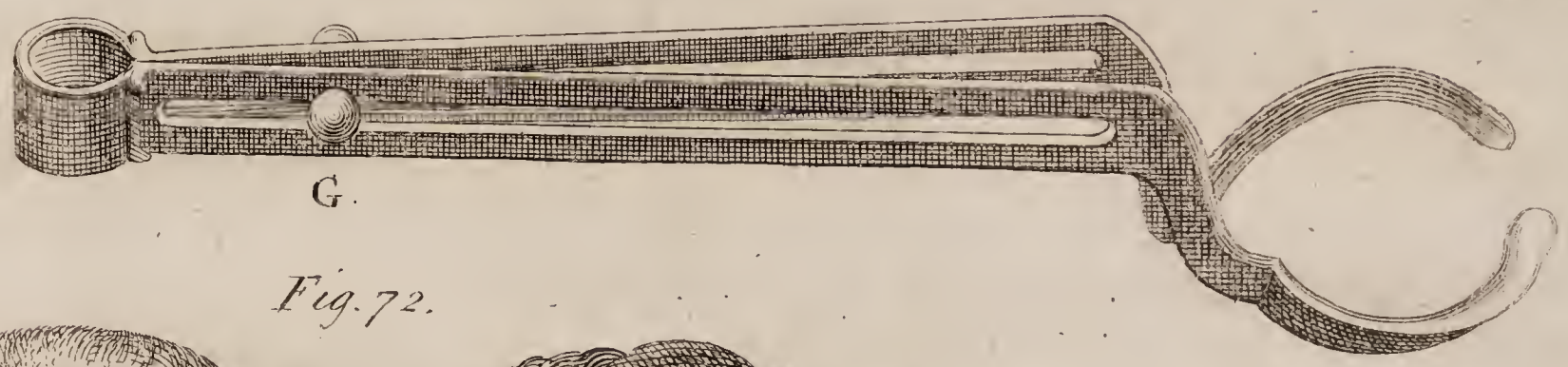


Fig. 72.

Fig. 73.

Fig. 76.

Fig. 75.

Fig. 74.

Toms sculp.t

ſwallowing either Liquids or Solids; every thing returning forcibly by the Mouth and Noſe, when he made an Effort to get it over. From all which I reckoned it an *Angina* of one of the worſt kinds, *ſine apparente tumore* (*a*), and the Seat of the Diſeaſe in the *Larynx* and the Fibres common to it, and the Top of the Gullet.

Notwithſtanding repeated Bloodings, Bliſtering between his Shoulders, Cupping, *&c.* the Diſeaſe continued ſo obſtinate, and the Patient ſo like to ſuffocate, that next Day in the Afternoon his Friends, although very averſe in the Morning, when I firſt propoſed the piercing the Windpipe, at length earneſtly deſired that the Operation might be performed; and the poor Lad bad us try any Experiment to preſerve his Life. He had good Reaſon ſo to do; for indeed, in all Probability, in a few Hours he would have been ſtrangled to Death moſt miſerably. We directly ſet about the Operation, which was done with ſuch Succeſs, that in leſs than four Days, his Breathing being perfectly eaſy, and his Deglutition being almoſt ſo, we removed the *Cannula*, and left the *Glottis* to do it's own Office.

According to *Cælius Aurelianus*, (*b*) and the Author of the *Liber Introductorius* (*c*) aſcribed to *Galen*, *Bronchotomy* was propoſed by *Aſclepiades*, (however inconſiſtent with his Delicacy, and the reſt of his Character, the ſeeming Harſhneſs of this Operation may appear) and is deſcribed and earneſtly recommended by almoſt all the ſyſtematical Writers of Surgery from *Paulus* of *Ægina* (*d*), and, as he ſays, *Antyllus*, and ſome other of the beſt Surgeons before him, down to the preſent Times. But when they are at ſo much Pains to defend the Reaſonableneſs of it, and when they ſhew ſo much Fondneſs of citing and telling Examples of the healing accidental Wounds of the *Trachea*, without ever mentioning their own regular Performance of the Operation (which would have been a ſhorter and much more effectual Recommendation of it) when I ſay I conſider all this, I find myſelf obliged to think that it has very ſeldom been reduced to Practice. So rare had it been that *Aretæus*, a Man of vaſt Judgment and Skill in Diſeaſes (*e*) thought the Operation had never been actually done with Succeſs. And *Cælius Aurelianus* looked on it as an impracticable Whim of *Aſclepiades*. Neither *Avenzoar* (*f*) nor *Albucaſis* (*g*) knew any of their Countrymen who had undertaken it. And the *Arabians* are reputed to have been hardy Surgeons enough. The moſt I know of amongſt them of this Kind is in *Avenzoar*, who tried the Experiment on a Goat, and cured the Wound which ſhews the Ingeniouſneſs and Induſtry of the Author. For as to what you will find ſome Writers telling you, that *Raſes* (*h*) ſaw *Andruſius* the Phyſician do it (the Copy I looked into, printed at *Venice* 1505, calls him *Anciliſius*: and perhaps it ſhould be *Antyllus*

(*a*) *See* Hippocr. Prognoſt. xxiii, 3. & Prænot. Coac. iii. 96. (*b*) Acut. iii. 4. (*c*) Cap. 13. (*d*) De Re Medic. vi. 33. (*e*) Cur. Acut. i. 7. (*f*) Medic. i. x. 14. (*g*) Chirurg. ii. 43. (*h*) Contin. vii. *Fol. m.* 77.

for

for them both) I think this flows from a miſtaken Interpretation of that Author's Meaning. If you read the whole Context, I think you will eaſily conceive, that all he ſays of the Operation is upon hearſay; and conſequently, that he had only ſeen in Books, that ſuch a one had done it. That moſt accompliſhed Anatomiſt and Surgeon *Fabricius ab Aquapendente* (*i*) frankly acknowledges, that neither he nor any of his Contemporaries had ever ventured to perform it. Neither does his Succeſſor in the Profeſſion of Surgery, and his Rival in Anatomy, *Julius Caſſarius* of *Placentia* (*k*) pretend to have done it; though he has endeavoured to illuſtrate the Operation by ſome very neat Figures; which you will not readily ſuſpect to be from any but dead Bodies. And next to him *M. Aurelius Severinus* (*l*), who was a very judicious and learned Man, and the beſt and boldeſt Surgeon of his Time; though he recommends it with a great deal of Warmth and Keenneſs, yet it ſeems even in his latter Days, he never had occaſion to try it: ſo that the firſt undoubted and diſtinctly recorded Hiſtory I can find of this Operation being actually practiſed, is in the learned *Anton. Muſa Braſavolus* (*m*) who performed it in a deſperate Squinance, when the Surgeon refuſed to do it; and repeated it again in the like Caſe. Mr *Arnaud* the *Frenchman* did it; but his Patient died (*n*). However, his Countryman Mr *Binard* had better Succeſs (*o*). Dr *Friend* (*p*) cites *Purman* doing it; and (*q*) tells us of another Caſe communicated to him by a Surgeon whom he does not name. And beſides theſe, I believe there are but few Inſtances can be produced, of any who really performed the Operation on a living Perſon. I hear now that Mr *Baxter*, a Surgeon in *Coupar* of *Fife*, not far from us, and Dr *Oliphant* in *Gaſk* in *Perthſhire*, did it with very good Succeſs within theſe few Years.

In the actual Performance of the Operation they certainly did, or might have obſerved ſome things omitted by Authors, and even ſome not perfectly agreeing with the common Accounts that are given of it. I think it worth while to obſerve, that in the very cutting, before we got a free Aperture into the *Trachea*, and the Pipe introduced, the Patient felt ſome Relief; which I thought might be aſcribed to the Effuſion of Blood in the Operation; a ſmall Quantity whereof evacuated ſo near the Part affected, could not, according to the true Laws of *Hydraulics*, and the Obſervations and Practice of the Ancients, (however diſagreeing with *Bellini*'s *Theory*) but make a more conſiderable Revulſion, than a much greater taken away at a great Diſtance. Whence the judicious *Fab. ab Aquapendente* (*r*) with very good Reaſon ſuppoſed that by the Derivation here, the Patient

(*i*) Operat. Chirurg. xliv. *p.* 477. (*k*) De Voc. Org. i. 20. (*l*) Chirurg. Effic. ii. 40. (*m*) Com. in Hippocr. de Diæt. in acut. iv. 35. (*n*) *See* Garengeot Operat. Chirurg. xxxi. *p.* 489. (*o*) Garengeot ibid. xxxii. *p.* 498. (*p*) Hiſt. Phyſ. l. *p.* 206. (*q*) Pag. 207. (*r*) Pag. 480.

would

would be more apt to feel ſome Relief than Trouble. Which *Julius Guaſtavinus* too made no Doubt of in his Diſpute upon this Subject againſt *Aretæus* (*s*). And now their Suppoſition and Conjecture is confirmed by Experience. And ſince there continued a greater Flux of Blood to the Wound while it was ſuppurating, I reckoned the Circulation in the Muſcles of the *Larynx* to be with leſs Force than ordinary, and ſo probably to contribute to the diminiſhing the Strength of the Voice, which for a good many Days after the Operation, was obſerved to be much weaker than it uſed to be. Which I all along thought was rather owing to this, and the Lowneſs of his Body by his ſlender Diet, *&c.* than to any Hurt of the recurrent Nerves; which being cut, do indeed deſtroy the Voice, but by their Deepneſs, are in leſs Hazard than ſome in old Times uſed to think.

In doing the Operation on a living Perſon, one cannot but remark at the very firſt, that the *Cannula* ſhould not be made near ſo ſhort as is ordinarily propoſed in Books and chirurgical Lectures: For we found that upon cutting the Parts, eſpecially the *Thyroid Gland* (which is not ſo much minded in moſt of the common Deſcriptions of this Operation as ſhould be) ſoon become ſo tumified, that it will require a Pipe above an Inch long, to penetrate ſufficiently into the *Aſpera Arteria*. Which is more than double of *Garangeot*'s Allowance of ſix Lines; who is one of the receneſt Writers, and has communicated to us all the Surgery the *French* are Maſters of. The Leaden Pipe we had prepared not anſwering the Deſign, that which we made uſe of was too long and too ſmall, being the common *Cannula* for tapping in the Dropſy, flatned a little at the End, and hindered by a very thick Compreſs, perforated in the Middle, from penetrating too deep into the *Trachea*.

The mucous Particles and Steams ariſing from the Lungs, made a conſtant weeping of a thin ſlavery Liquor, from the Mouth of the Pipe, part whereof thickening, and ſtuffing it's Cavity, ſometimes very much incommoded the Patient's Reſpiration by it, ſo as to render it neceſſary to have it taken out and cleaned. And hence, when ſome Moderns very preciſely bid us put a thin Slice of Spunge, or a bit of Muſlin, *&c.* cloſe over the Orifice of the *Cannula*, to prevent the Ingreſs of Duſt, Down, or the like, into the Lungs, it confirms what I ſaid before of the Unuſualneſs of the Operation, and looks as if they had only contemplated the Matter in *Abſtracto*, as the *Metaphyſicians* ſay, without conſidering they had not to do with a pure thin dry Air, but with a heterogeneous Fluid, that is moiſtened and thickened with viſcid Particles, which are apt to run together in ſtiff Concretions. And therefore, though it muſt be acknowledged, that there would have been leſs Hazard of a Stoppage, if our *Cannula* had been ſhorter, and wider, eſpecially at the Mouth. I cannot but think it

(*s*) See *M. Aur. Severin. p.* 103.

an ingenious Propoſal of one of our Miniſters here, to make the Pipe double, or one within another; that the innermoſt might ſafely and eaſily be taken out and cleaned when neceſſary, without any Moleſtation to the Patient: For it is no ſmall Trouble to him, to be obliged to have the Bandage frequently removed, and the Pipe fitted a-new to the Orifice made in the *Trachea*.

And indeed we found no Inconvenience in our Patient's breathing the Air as it paſſed through the Pipe, without any cleanſing or intercepting *Medium*, though the Houſe was none of the cleaneſt, being an ordinary Tradeſman's here. But if by a larger, and conſequently a more patent Tube, one, eſpecially of more delicate and tickliſh Lungs, ſhould be incommoded that Way, I think the Acceſs of Duſt, *&c.* might conveniently enough be hindered by a Piece of Muſlin, or thin Hair-Crape, tied ſlackly about the Neck over the Orifice of the *Cannula*, ſo however as not to touch it, or to be wetted by the Liquor coming from it.

The Patient was ſoon perfectly recovered: He breaths, ſpeaks, eats, drinks, and performs all the other Offices of Life, and goes about his Calling as formerly. And now I cannot but take notice the needleſs Pain ſome Writers are in about healing up the Wound by Bandaging, Stiching, *&c.* For we found it eaſily to fill up of itſelf in a very few Days, by only dreſſing it every other Day, or ſo, with a ſoft Tent, made leſs and leſs every Dreſſing, and armed in the common Way with *Liniment. Arcæi.* I believe indeed it would have taken a little more Time to heal, if our Patient had been older.

Obſervations on a Treatiſe writ by M. Helvetius, *of* Paris, *to prove that the Lungs do not divide and expand the Blood, but on the contrary cool and condenſe it; by* F. Nicholls, *M. B. Præl. Anat.* Oxon. *and F. R. S.* N° 410. p. 163.

II. The Matter in Queſtion between the Author and *Michellotti* is, whether the Lungs cool and condenſe the Blood, according to the Opinion of the Antients, or whether they mix, attenuate, and, of conſequence, expand it, according to the Syſtem of Dr *Pitcairn*.

The Author, in order to ſupport the Opinion of the Antients, brings ſeveral Arguments to confute the Syſtem of Dr *Pitcairn*: The moſt conſiderable of which (and which indeed he makes his *Argumentum crucis*) is, that the right Auricle and Ventricle being conſiderably larger than the left Auricle and Ventricle, and the pulmonary Artery having a larger Capacity than all the pulmonary Veins taken together, the Blood muſt evidently occupy a greater Space before, than after it's Paſſage through the Lungs; and becauſe the Difference in the Capacity of theſe Veſſels cannot be ballanced by any Increaſe of the Velocity, he concludes, that the Blood is not attenuated and expanded, but muſt be condenſed in it's Paſſage through the Lungs. And this he conceives is done by the Air, which (as a Fluid relatively cold) muſt cool and condenſe the Blood, to which it is ſo nearly applied in the Action of Inſpiration.

That the Blood is cooled by the Action of Inſpiration, is a Matter of which I believe few Phyſicians doubt, when they conſider, that in Inflammations of the Lungs, nothing is more earneſtly deſired than the

the breathing cool and freſh Air, nor does any thing more evidently conduce to the Cure of Inflammatory Diſpoſitions, than the Uſe of freſh Air.

If we conſider the State of the Blood at it's Return to the Heart, and how careful Nature has been, not to uſe this Blood for the Nouriſhment of the Lungs, before it has paſſed through the pulmonary Vein and Artery (though it would in that Caſe have been as effectually cooled in the Bronchial Arteries as in the pulmonary Veſſels) we are naturally led to believe, that it is ſome other Quality, which has rendred it improper for Nouriſhment, and which is to be deſtroyed by the Action of the Lungs.

For this Reaſon, and from the Structure of the Parts ſubſervient to breathing, it ſeems evident, that the Blood is mixed, attenuated, and conſequently re-expanded in the Action of Expiration. I ſhall now conſider, whether the Action of Inſpiration, ſo far over-balances the Action of Expiration, as to condenſe the Blood into a leſs Bulk, than it had before it's Paſſage through the Lungs.

The accurate *Santorini* of *Venice*, in the 8th Chap. and 3d Sect. of his Obſervations, has carefully examined the Fact, as ſtated by *Helvetius*; and finding it true in that one Subject, as to the Auricles, and pulmonary Veſſels, but falſe as to the Ventricles, he proceeds to prove, that this Difference in the Capacity of the pulmonary Veſſels, could not be deſigned on Account of the Blood's being condenſed in it's Paſſage through the Lungs; becauſe, if ſo, the right Ventricle ought to have been larger than the left Ventricle; and the pulmonary Artery ought, not only to have been larger than the pulmonary Veins, but it ought likewiſe to have been larger than, or at leaſt equal to, the two *Venæ Cavæ*; whereas, in his Subject, the two *Venæ Cavæ* were to the pulmonary Artery, as 228 to 188.

In the mean time, he recommends the repeating the Enquiry to other Anatomiſts, as doubting whether the Fact is conſtantly ſo in healthy Subjects.

As ſuch an Enquiry may be of Conſequence, not only in ſettling the Point in Queſtion, but in explaining other Parts of the Animal Œconomy, I doubt not but it will be agreeable to the Society; and the rather, becauſe the Subjects from which I have taken the ſeveral Calculations, are here produced before the Society, and ſubmitted to a Re-examination if deſired.

The Meaſure which I have here uſed, is the 113th Part of an Inch.

I have taken the Triple of the Diameter for the Periphery, and computed the *Area*, by multiplying the neareſt whole Number to $\frac{1}{4}$ of the Diameter into the Periphery. Though this Method is not ſufficiently exact to ſhew the real Contents of Circles, yet as my Deſign here, was only to find nearly the relative Contents of the ſeveral Veſſels, I have choſen to avoid embaraſſing the Sums with Fractions.

The firſt Heart is of an Adult, in which

	The	*Diam. Per. & Areas*, are		
Of the Vena Cava deſcendens	79	237	4740	
Pulmonary Artery	115	345	10005	
Superior left pulm. Vein	69	207	3519	
Inferior left pulm. Vein	73	219	3942	
Superior right pulm. Vein	49	147	1764	12477
Middle right pulm. Vein	40	120	1200	
Inferior right pulm. Vein	57	171	2052	
Aorta	110	330	8910	

The aſcending Cava being tied above the Diaphragm, could not be meaſured in this Subject.

As Monſ. *Helvetius* no ways mentions the Diſeaſe, of which the Subject died, from whom he took his Obſervation, ſo I cannot ſay how proper it was for ſuch an Examination; but it is evident, his Obſervation does not tally with the Calculations made from this firſt Heart; where the pulmonary Artery is to the Sum of all the pulmonary Veins as 10005 to 12477. And yet this Subject (beſides a cancerated Ovary, and a Putrefaction of the right Kidney from the Ureter's being compreſſed) had her Lungs full of ſmall Tubercles, and the Glands lying between the great Diviſions of the *Trachea*, almoſt petrified by atheromatous Concretions: By all which it is highly probable, that the Paſſage of the Blood, through the Lungs, was very much impeded, and of Conſequence, the pulmonary Artery much dilated beyond it's natural Capacity.

And this I am the rather induced to believe from examining the ſecond Heart, which is of a Child nearly twelve Months old. As to it's Death, I can ſay nothing more, than that it's Lungs appeared perfectly ſound, and of a pale clear Colour; and therefore the more proper for an Examination of this Kind.

	In this ſecond Heart, the	*Diam. Per. & Areas*, are		
Of the Aorta above the Coronaries	43	129	1419	
Pulmonary Artery	43	129	1419	
Superior left pulm. Vein	29	87	609	
Inferior left pulm. Vein				
Superior right pulm. Vein	26	78	507	2088
Middle right pulm. Vein	17	51	204	
Inferior right pulm. Vein	32	96	768	

We may here obſerve, that the Aorta, after giving off the Coronary Veſſels, is equal to the pulmonary Artery. As to the Proportion between the pulmonary Artery and Veins, the Artery in this Subject is to the Sum of all the Veins here meaſured, as 1419 in 2088, and yet the lower

lower left pulmonary Vein is here omitted, as being tied too cloſe to admit of being meaſured. But if we ſuppoſe the inferior left pulmonary Vein to be to the ſuperior left pulmonary Vein, in the ſame Proportion as in the firſt Heart, we ſhall then find it's Diameter nearly 31, and it's Area at leaſt 700, which will make the pulmonary Artery in this Heart, to the Sum of all the pulmonary Veins as 1419 to 2788; and in that Caſe, the left pulmonary Veins will be to the right pulmonary Veins, but as 1309 to 1479.

The 3d Heart is of an Abortive, nearly of 5 Months: By it's Appearance, I judged it ſuffocated by too much Blood. In this Subject, the

	Diam.	*Per.*	*Areas* are,	
Of the Vena Cava deſcendens	14	42	197	629.
Vena Cava aſcendens	24	72	432	
Aorta above the Coronaries	16	48	192	
Pulmonary Artery	20	60	300	
Canalis Arterioſus	12	36	108	
Right pulmonary Branch	11	33	99	198.
Left pulmonary Branch	11	33	99	
Superior left pulm. Vein	11	33	99	294.
Inferior left pulm. Vein	9	27	54	
Superior right pulm. Vein	7	21	42	
Middle right pulm. Vein.	11	33	99	

The inferior right pulmonary Vein is here cut too cloſe, and otherways injured, ſo that it's Area cannot be meaſured. Nevertheleſs we find the remaining pulmonary Veins to the pulmonary Branches of the pulmonary Artery, as 294 to 198.

We may here obſerve a remarkable Difference between the Capacities of the two *Venæ Cavæ* taken together, and the pulmonary Artery; the two *Cavæ* being more than double the pulmonary Artery, and the pulmonary Artery ſtill one Third larger than the Aorta. As this Difference could not ariſe in this Caſe from the Blood's being condenſed by the inſpired Air, ſo it ſeems a Proof, that had the Fact been true, as ſtated by *Helvetius*, it had nevertheleſs been an inſufficient Demonſtration of his Syſtem.

A Polypus coughed up from the Windpipe, by Dr Samber, N°. 398. p. 262.

III. *Dec.* 15th at 10 at Night, I was ſent for to an Officer of the Exciſe in *Saliſbury*, who was taken with ſo violent a Flux of Blood, that in a ſhort ſpace of time he loſt near three pounds: By the time I came, it was pretty well over; only he ſeemed to have ſomething, when he coughed, that ſtuck in the Paſſage, which he could not get up, and by it's rattling I thought it very looſe. I ordered what I thought proper in ſuch a Caſe, and left him: Next Morning they told me that, half an hour after I was gone, he had coughed up what they ſhewed me on a Sheet of Paper. Upon putting it into Water, I found it a *Polypus*; and, as I think, a very remarkable one. I here ſend

Fig. 79. send you an exact Draught of it. I could find by my Blow-pipe, that it was hollow; but it's being torn off with such violence, has made so many Holes in it, that it cannot be blown up. You will (I believe) conclude, it lined the *Bronchia*, and that the Air had a Passage through it, and that a violent Fit of coughing had separated the Adhesion, and brought on that violent Flux of Blood, *&c.* He had been tormented with a Cough for more than six Months, was a gouty Man; but after this was coughed up, and so large an Ulcer made, he had all the successive Symptoms of a fatal Consumption; as Cough, Spitting, Hectic, colliquative Sweats, Diarrhæa, and died the 16th of *January*, aged near 50.

A Polypus, *resembling a Branch of the* Pulmonary Vein, *coughed up by an asthmatic Person. By* Frank Nicholls, *M. D. F. R. S.* N°. 419. p. 123.

2. *Nicholas Tulpius*, in the 7th Observation of his second Book, presents us with the Case of a Man, who, with a large Effusion of Blood, threw up, by coughing, two Branches of the *Pulmonary Vein*, six Inches long, with their several Ramifications, freed from the *Trachea*, and Substance of the Lungs, as if dissected by the most accurate Anatomist. This Case he observes to be very extraordinary, and not to be parallelled in the Writings of physical Authors.

A little Acquaintance with the Structure of the Lungs, sufficiently evinces the Impossibility of the Fact, as there stated; wherefore (not doubting the Veracity of the Author) I always believed him to be deceived by a *Polypus* of the Vein, which might be coughed up in the Manner by him described.

But the following Case will give another Light to this Affair. *July* the 18th 1730, I was consulted on Behalf of one living in *Essex*, who was asthmatic, and coughed up Phlegm, resembling Worms; to remedy which, I directed a *Lac Ammoniacum*, with Squills; from the Use of which he expectorated more easily, but continued still to cough up the same Substances.

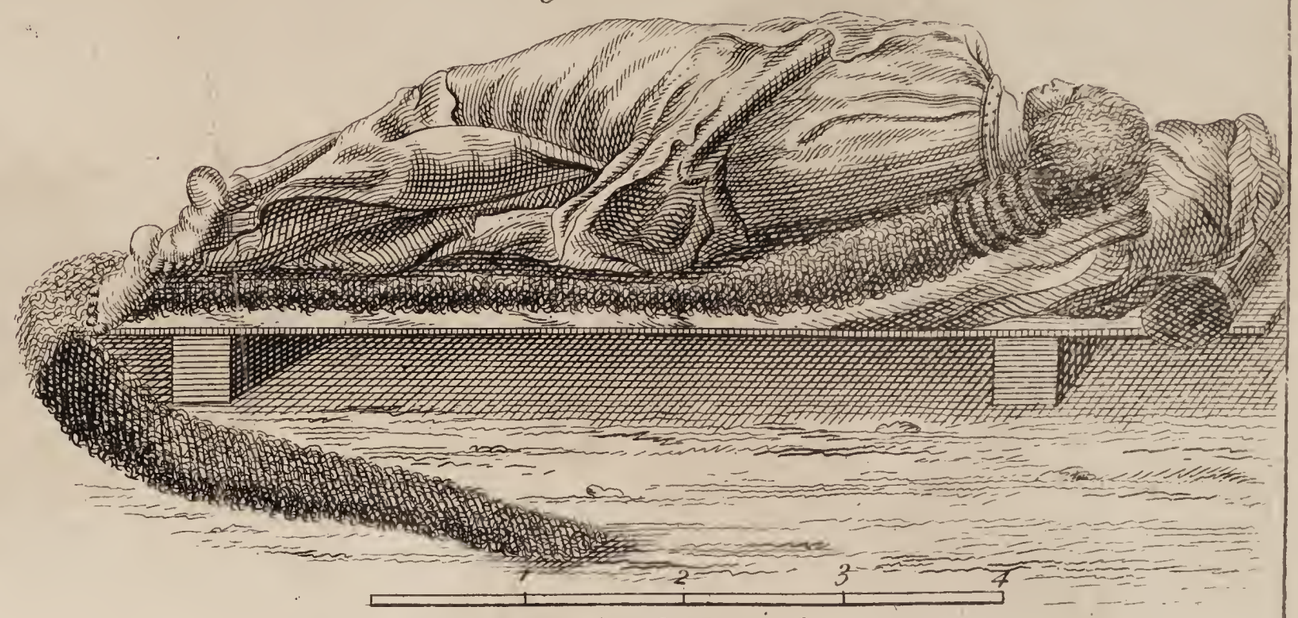
The 11th Instant, on the Road to *London*, he was seized with a Shivering, and pleuritic Pains; a white Tongue, hard and quick Pulse, *&c.* By repeated Bleeding his Pains decreased, but the Cough remained more violent than usual. On examining the expectorated Phlegm (which was tinged with Blood) I found it fibrous, and when expanded in Water) exactly resembling the Vessels in the Lungs. These Substances are as tough as the Coats of the Veins, and (like them) hollow. He has coughed up more or less of them every Day, for seven Years; sometimes perfectly white, and sometimes tinged with Blood: Notwithstanding which, he has had no other Complaint, has had a good Appetite, and Colour, and a greater Share of Fat than any Man would choose. The Specimen here shewn was expectorated, when I was present, the 16th Instant. It nearly resembles the first Draught of *Tulpius*, and is no more than a viscid Phlegm, secreted by the relaxed Glands of the *Trachea*, and afterwards concreted by the Heat of the Part.

Fig. 80.

Plate XVI. Vol VII. part III. page. 504.

Fig. 77.

Fig. 78.



A Scale of 4 Paris feet

Fig. 79.

Tours sculp.t

IV. 1. *May* 10th, 1726, I opened the Body of a Perſon, who died the foregoing Day of a *Peripneumonia*; in the right ſide of whoſe *Thorax* I found an oſſeous Subſtance, about $\frac{1}{4}$ of an Inch thick, 6 Inches long, and 3 broad, extending it ſelf under the third, fourth, fifth, and ſixth Ribs, cloſely and ſtrongly connected to the *Perioſteum* of the Ribs, and the *Tunica propria* of the inner Intercoſtal Muſcles, by Fibres, which ſhot from a ſtrong and thick intervening Membrane, which cloſely adhered to it's outer Surface or Back, and was continued over it's inner likewiſe, thereby forming a *Capſula* for this præternatural Subſtance. It's upper Edge lay immediately below, and was contiguous to that Part of the Ribs, where they become cartilaginous: The Membrane that adhered to, and covered it, continued thick ſome diſtance from it, and gradually grew thinner, and was at length loſt in the *Pleura*; from whence I judged this extraneous Body to have been formed between the two *Lamellæ* of that Membrane. The Lungs ſo ſtrongly adhered to it's Inſide, that upon ſeparating them, part remained to it: Upon cutting into which, I obſerved all the Cells ſtuffed with a thin, but ſomewhat digeſted, *Pus*.

A præternatural bony Subſtance found in the Cavity of the Thorax, *by Mr.* William Giffard, *Surgeon*, N° 395 p. 152.

Upon farther Enquiry, I found on the ſame ſide, towards the Back, another Subſtance, but perfectly Bone, inveſted as the former, with a ſtrong and thick Membrane, and by the Fibres, which ſhot from it, tied to the Body of the *Vertebræ*, and the fourth, fifth, ſixth, and ſeventh Ribs, and Intercoſtal Muſcles.

It's Back, or Outſide, was convex, agreeable to the concave Surface of the Ribs, which had made Indentations on that part of it where they preſſed: It's Inſide was concave as the Ribs; the right Lobe of the Lungs ſtrongly adhered, part of which, for that reaſon, remained to it after Separation: It's Length was about ſeven Inches, Breadth about three from Edge to Edge: It's Thickneſs, in ſome Parts $\frac{1}{3}$, in others $\frac{1}{4}$ of an Inch. It had, as the former, a thick Membrane running from it, which gradually thinning was at length loſt in the *Pleura*; from whence I judge this extraneous Subſtance to have been formed as the fore-mentioned.

2. He was troubled for ſome Years with a ſhort Cough, which latterly was accompanied with a difficulty of Breathing, and great Labour in Inſpiration; and ſome time after, with a Weight and Pain on the right Side; which Symptoms encreaſing more and more, brought on the *Peripneumonia*, of which he died in a few days. The Riſe and Succeſſion of thoſe different Symptoms proceed naturally from the Formation and Growth of this præternatural Body, as well as the particular Part of the *Thorax*, where it was lodged.

A farther Account, by W. Rutty, *M. D.* N°. 395. p. 153.

The

CHAP. V.

The ABDOMEN.

An extraordinary sharp Impostbumation of the Liver; by Tho. Short, *M.D.* No. 420. p. 184.

I. I Had a Patient, who died lately of an *Impostumation* of the *Liver*; I opened him, and out of the loweſt and thinneſt *Lobes*, I took ſix Quarts of purulent, thick, moſt intolerably fetid, reddiſh-brown Matter, very acid; for no ſooner was it expoſed a little to the open Air, than it fermented exceedingly. The Patient had drained off the thinner part the laſt Week of his Life by violent vomiting, and purging to thirty or forty times a Day. It was thrown into the *Duodenum*, by the *Ductus Cholidochus communis*, and there pumped up and thrown out, both by it's Sharpneſs and Stimulation. All the upper Part of the Liver, to about an Inch below the Gall-bladder was ſound. The Tumour had ſo compreſſed the right Kidney, that it was emaciated away to leſs than the *Glandula Renalis*.

Two Caſes of Wounds in the Stomach, by the Rev. Mr James Field, *Rector of St* John's *in* Antegoa, No 371. p. 78.

II. A luſty young Negro-Man, returning home about Noon, went into his Houſe, where ſeeing ſome ripe Plantains, he eat of them heartily; his Father in-Law, about 60 Years of Age, coming home ſoon after, and finding the young Fellow had taken his Plantains, gave him a moſt deſperate Wound with his Knife, in the upper Region of the Belly, a vaſt Gaſh being made in the Stomach, in ſo much that the Plantains which he had eaten, burſt through the Wound, which was made ſtreight up and down.

The old Man immediately fled for it, the young Fellow's Companions, hearing what was done, purſued him, who ſeeing them follow him in this manner, and get ground of him, and ſuſpecting their Deſign was to kill him, pulled out the ſame Knife, with which he had ſtabbed the other, and gave himſelf as deſperate a Wound, as he had given him, and in the upper Region of the Belly, his Stomach being likewiſe ſeen, only with this Difference, that this laſt Wound was tranſverſe, or from left to right; the old Fellow was carried Home, and laid in the ſame Houſe, where the other wounded Fellow lay.

This Accident happened about Noon, and Mr *Forreſt*, the Surgeon, came not to dreſs them till between four or five; he ſtitched up the Stomachs of them both entirely, and their Bellies too, only leaving in each a ſmall Hole for Suppuration; a Fever ſeized each of them, the old Man was in moſt Danger, the Fever held them about a Fortnight; the Wounds were brought to a good Digeſtion, and in a Month's time, or thereabouts, the young Fellow went abroad, but the old Man lay ſomething longer. They were both perfectly cured, and have been very well ever ſince, though it is above fifteen Years ſince this Accident happened.

III. I had

III. I had a Patient about ſeven Years ago, who had a large Tumour on the upper Part of her Belly, it was hard and painful, but did not alter the natural Colour of the Skin, and had been three Months in coming. I applied a warm Gum Plaiſter to it, which in about a Fortnight's time brought it to a Suppuration. I then applied a Cauſtic about the bigneſs of a Shilling; when the Eſchar fell off, I ſaw a ſolid kind of Subſtance appear in the Orifice, I laid hold of it with my *Forceps*, and pulled it gently towards me, upon which there thruſt forcibly out a quantity of it, that near filled my Hand, ſo I dreſt it. Next dreſſing, the ſame Subſtance appeared again, which on her ſtraining, forced out near twice as much as before. I was at a great Loſs to determine what this ſtuff was, but at laſt concluded it was the *Omentum* itſelf in which Opinion I was confirmed by ſome other Surgeons to whom I ſhewed it. I was ſtill in doubt, whether the Stomach was concerned in this Caſe or not, till the next Removal of the Dreſſings, at which there ſpurted out above half a Pint of Ale, in a full Stream, which ſhe had drunk a little while before. I now concluded the Caſe mortal, however, I ordered her to keep her Bed, to lie conſtantly upon her Back, and feed on Things of eaſy Digeſtion. The greateſt part of what ſhe eat or drank, came through the Ulcer for eight or ten Days, ſo that I had no hopes of ever curing it; yet, contrary to my Expectation, in about ſix Weeks, ſhe was perfectly cured, and is now living, and in good Health.

An Impoſthumation in the Stomach; *by Mr* Atkinſon, *Surgeon*, No. 371. p. 80.

IV. *James Skidmore* had complained for three or four Years laſt paſt, of a violent Pain in his Stomach and Bowels, never being able to reſt in his Bed at Night, 'till he had vomited up the greateſt Part of what he had eat or drank the Day before. He would often compare his Pain to ſome great Weight, lying upon the Region of the Stomach, which, he in ſome Meaſure alleviated, by preſſing hard with his Hand upon that Part. When he turned himſelf in Bed, from one ſide to the other, he told me, he could plainly perceive ſome Fluid fall down with Noiſe to the depending Side; which Fluid he believed to be the Occaſion of all his Miſery: For which Reaſon he often ſaid, he would willingly conſent, nay, often earneſtly preſſed, that the Surgeons would cut him open (as he expreſſed it) and let it out.

A preternatural Perforation in the upper Part of the Stomach; *by Mr* Chriſtoph. Rawlinſon, *Surgeon*, No. 400. p. 361.

He had no apparent *Tumour* upon the Part, nor was his Belly more extended than uſual. He had had the Advice of ſeveral able Phyſicians, before he came into the Hoſpital, but all without the leaſt Amendment to his Diſeaſe. When he died, we were deſired to open him, and try if we could find out the Cauſe of his Complaints. As ſoon as we had penetrated the *Peritonæum*, there flowed out a whitiſh Liquor, not much unlike Whey, only a little more thick and fæculent; nor did it emit ſo noiſom a Smell, as might be expected from it's long Reſidence in that Place. We computed there were above four Quarts of this Liquor contained in the *Cavity* of the *Abdomen*.

We found the Stomach *perforated* in it's *upper* Part, about the middle Space betwixt the two Orifices, wide enough to contain the end of one's Finger, We cut it open length-ways, and found it pretty full of a thick glutinous Matter, inclining to be yellow; and to it's inner Coat, on the lower Side, there firmly adhered the Stone of a *Prune*, or ſome other Fruit reſembling it. On it's Inſide, near the preternatural Perforation, it was gangrened for two or three Inches; and on the other Side of the Perforation there was an Ulcer near the ſame bigneſs. The whole Stomach was a great deal thicker than uſual; but that Part, next the *Pylorus*, was above four times thicker than in a natural State. It adhered cloſely to all the Parts about it; and to the *Pancreas*, it was ſo firmly tied down, that it could not be ſeparated without tearing. The Spleen did not exceed a quarter of an Ounce in Weight. The *Pancreas* was *ſchirrous*, though pretty near it's natural Size. In the Liver and Kidneys, there was no apparent Defect; nor had the Parts in the *Thorax* received any viſible Alteration, except that the Lungs adhered more firmly to the *Pleura* than uſual. The *Inteſtines*, and all the *Viſcera* contained in the *Abdomen*, were of a whiter Colour than uſual, by being ſo long ſodden in the Liquor in which they floated.

A Striƈture in the middle of the Stomach, dividing it into two Bags. By Claudius Amyand, *Eſq*; *F.R.S.* N°422. p. 260.

V. Upon opening the Body of a young Country Girl, dead of a Conſumption, I found her Lungs ſuppurated in many Places, and a *Striƈture* in the middle of the Stomach, dividing it into two Bags. This *Striƈture* appeared to have been of ſome ſtanding, and likely to have occaſioned ſome Difficulty in Digeſtion; but upon Enquiry, her Miſtreſs and Fellow-Servants ſaid, that her Appetite and Digeſtions were natural, and that ſhe had continued in a good Plight, till upon coming to *London*, ſhe contraƈted a Cough, that had brought on the Conſumption.

Vomiting of Blood cured, by drinking exceſſive cold Liquors in Winter; *by* PeterAnthony Michelotti, *M. D. F. R. S.* N°. 419. p. 129.

VI. Quum Ludovicus Maffetti, rure, ubi venatione, & perequitando ſe vehementer exercuerat, in urbem reverſus Sanguinem 10°. Cal. Jan. 1728. ad uncias quinque ſexve matutinis temporibus vomeret, hujuſcemodi curationem inſtitui. Primùm, quod Cruoris in Arterias, Venaſque vim, eas diſtendere continenter nitentem inſigniter, & præcipuè ex ſuperfluente Sanguineæ materiæ copia adauƈtam animadverterem; minimèque ignorarem Juvenem laborare ſchirrhoſo lienis tumore, ob quem, & Sanguinem vel hos ante quatuor annos evomuerat, & narium copioſis hæmorrhagiis à prima uſque adoleſcentia vere, & autumno quotannis tentari conſueverat; quæ, poſteaquam fortuitò à luſoribus follis capiti impaƈtus fuerat, ferè ex toto defecerant; quòd hæc, inquam, minimè ignorarem, ad uncias circiter 8 ex hæmorrhoidibus Sanguinem per hirudines protinus mitti, ejus copiæ demendæ, atque à liene, & ventriculo avertendæ cauſa præcepi; tùm aquam ex Plantaginis ſucco, corallato, nitro bene ſaturam cyathi menſura ſæpius eo die ſorbendam præbui ad Sanguinis fervorem compeſcendum. Sanguineo verò vomitu circà ſecundam noƈtis vigiliam vehementiùs urgente, ſub eoque, Sanguine maximo impetu copioſiſſimè

copioſiſſimè ad os ruente, aquam ex Lactucæ ſucco, cydoniati J. B. Helmontii *Laudani* guttis duodecim, unciarum quatuor pondo commiſtam confeſtim potui dedi, & Cruoris potiſſimùm velocitatis minuendæ, & ſomni accerſendi ergô: quod medicamentum, quum Æger, Sanguine ex ventriculo tertiùm, quartùmque ingenti copia erumpente, rejiceret, ad catapotia ex perſici *Philonii* ſcrupulis ſex, ex aqua ſucci Sanguinalis herbæ devoranda decurrri. Sub idem tempus gelidam aquam frigido aceto permiſtam ore contineri, ſpongiamque perfrigido aceto benè imbutam epigaſtricæ regioni admoveri juſſi, ad ſanguifera ſtomachi vaſa, ſivè exeſa, ſivè rupta, ſivè quocunque modo patefacta conſtringenda: quem in finem, quandoquidem idem cruentus Vomitus quintùm, ſextùmque revertebatur, atque Æger exanimari videbatur, non modò ad confectionem ex contuſis albi papaveris, & hyoſciami ſeminibus roſaceo ſaccharo, armenia bolo, ac lapide hæmatite adjectis, ſemicochlearii pondere devorandam decurrebam; ſed ad conſolidantia quoque catapotia, quæ ſub Autore *Helvetio* Patre feruntur, quorum terni ſcrupuli quarta quaque hora aſſumebantur ex aqua modò commemorata, in qua modica pollinis ex margaritis, & rubris coralliis in calcem redactis, itemque ex magiſterio oculorum cancrorum portio ſoluta erat. Per hæc auxilia conſecutus ſum, ut Sanguis per aliquot horas conquieverit.

A Sanguinis per ſectas Venas detractione ea nocte abſtinui: primùm, quòd Sanguinem ad libras 12, & ampliùs duarum circiter horarum ſpatio ex ore proceſſiſſe, jacentemque ob id, in conclavi frigido, paucis veſtimentis corpori injectis quietus animo linqui perſpicerem; tùm, quòd Cordis, & Arteriarum coagitatio, & quod conſequebatur, reſidui Cruoris pauciſſimi velocitas eſſet quam maxima; indè, quòd ad avertendum tantæ ſanguineæ materiæ à ventriculo curſum, exiguum Sanguinis emiſſionem, & parvo quidem tempore duraturam, ſivè ex parte ab ipſo affecto ventriculo minus remota, ſivè ex Vena quàm longiſſimè ab eo diſtante haud ſufficere, exiſtimarem; poſteà, quòd, vel per medicam, hujuſcemodi rebus circumſtantibus, Sanguinis detractionem, ſulphuratarum ſanguineæ maſſæ particularum ad coccineas maſſulas pænè ex toto deficientes proportionem jàm notabiliter (uti ex magna ſiti, corporis calore, brachiorum, & crurum jactatione, inſignique pulſus frequentia conjiciebam) increſcentem, una cum Sanguinis velocitate cruentum Vomitum rursùs excitare valente ſummopere adaugeri poſſe, providerem.

Albente cœlo, Vomitu denuò reverſo, ad Sanguinem, qui notabili tum quoque copia evomebatur, ſupprimendum, frigidum ex urenti urtica Succum, cui toſti opii grana 8 admiſta erant, ad uncias 4 potandum obtuli; qui quum ex toto non reſponderet, ad extremum ratiocinando conſtitui, & Sanguinis Ductus in ventriculi cavum pertinentes ejus aërem condenſando comprimere, & Sanguinem ab iis ſupportatum reprimere perquàm gelidiſſimis potionibus, quia verò cujuſquemodi generis cibos, ſivè ex contrito pane, ſivè ex recentium ovo-

rum vitellis, in gallinaceorum pullorum juſculis ſolutis, ſivè ex priſana hordeacea, oryzæque cremore, Æger morbo fuſus, ſtomacho maximoperê languente reddebat, ſorbitiones virium imbecillitati ſuccurrentes, neque onerantes delegi: & primùm quidem ex *Chioccolatte*; tùm ex vaccino lacte, & ſaccharo; indè ex hoc, & cremore ex dulcibus amygdalis, albique papaveris ſeminibus recèns expreſſo: cujuſmodi liquores frigoribus ex glacie & nitro congiaciati, ſcilicèt modò unus, modò alius quinta, ſextave quaque hora ad uncias circiter ſeptem hauriebantur, interpoſitis non multis quidem, ſed ſæpè nocte, ac die haud leviter ſitienti datis ex frigida Nucerina aqua potionibus. Quæ curandi via maximè, quemadmodum ego arbitror, rationalis mirificè quum conferret, in ea perſtiti ferè uſque ad Februarii menſis proximè inſequentis initium; quo tempore victum primis quidem diebus ex decocta in gallinaceo juſculo, oryza conſciſſove triticeo pane, eodem juſculo, bene madente, aut recenti ovo; in ſequentibus verò diebus ex carnibus quoque, modò gallinaceis, modò vitulinis, & interdum ex avibus imperavi: prætereàque ad imbecillem ſtomachum confirmandum præſcripſi tincturæ ex abſinthio ſine vini ſpiritu extractæ guttas circiter 60 quotidiè paulo ante prandium ex Pimpinellæ herbæ aquæ cochleario ſumendas.

Prætereo, me tertio, quartove morbi die vaccinum lac, butyro, ovi vitello, ac rubro ſaccharo admiſtis in ultima inteſtina per clyſteres infundi, curaſſe ad atrum ſanguinem ex ventriculo ad inferiores partes defluentem educendum: quem propterea quòd craſſi ex fuligine pulveris formam habere, animadverterem; à medicamentis ad Cruoris in ventriculi caveam effuſi concretionem prohibendam, tollendamve, in quocunque Vomitu Sanguinis ab aliis medicis præſcribi ſolitis abſtinere, ſatius duxi, quàm iis propinatis, ad effectum à curatione per gelidiſſimas potiones jàm proſperè inceptum perficiendum vires adhibere videri, ejuſmodi quam frigidiſſimarum Cruorem cogentium ſorbitionum viribus planè atque omninò contrarias.

Atque hac quidem ratione medendi Ægrotantem ad deſperationem redactum ex graviſſimi, & periculoſiſſima, de qua hactenus retuli, valetudine, liberavi: cui in eundem morbum deinceps relabatur, Sanguinis uncias ſeptem octove, tertio quartove quoque menſe mitti jubeo, plerumque ex brachiis, interdum ex hæmorrhoidibus. Iſtiuſmodi autem præſidii genere ad Sanguinis profuſionem prohibendam utendi, cauſa hæc eſt. Splenis ſcirrho ſupra commemorato, Sanguinei ad eum attinentes Ductus magnoperè obſtructo Sanguinis copiam, cui continendæ apti creati ſunt, profectò capere nequeunt; reliqui igitur corporis, & quod conſequitur, eò magis ventriculi ipſi lieni propinqui canales Sanguinem ducentes, quantitatem ejus naturali majorem contineant, neceſſe eſt: hique propterea ſic extrorſum trudi, ac dilatari poterunt, ut Sanguini continenter ex ipſis manare conanti patefiant; ſicuti plerumque contingit in maribus, fœminiſque, quibus Sanguinis ſputa, vomitus, aut ejus ex naribus profluvia propter

inſignes

insignes vaſorum vel infimi ventris obſtructiones fiunt. Sed in lienoſis præſertim copioſas, & immodicas Sanguinis ſuſque deque rejectiones vidiſſe ſe narrat Jo. Riolanus; hiſtoriaſque ex Hippocrate, & Valverda affert eorum, qui Sanguinis Vomitu ex turgente iplene interîêre. Id ergò malum ne accideret, præcavendum mihi exiſtimabam repetita Sanguineæ materiæ detractione. Et quoniam Sanguinis in ſuos Ductus impetus velocitatis quoque incremento augeri poteſt; ob hoc,& aquæ frigidæ potum vini loco, & abſtinentiam à venatione,curſu, aliiſque ejuſcemodi Cruoris motum vehementer accelerare potentibus imperavi,& eventu ſanè ad ultimum uſque menſem An. 1730, proſperimo

Nam eo anno poſtridiè Calendas Decemb. in eundem Sanguinis Vomitum noctu relabitur. Ad eum viſendum protinus accitus; quandoquidem libram unam tantummodò, alteramve Sanguinis evomuerat, & plenitudinem boni adeſſe Cruoris videbam: quanquam cruenta Vomitio continuabat, & Arteriæ ſub ea penè ex toto ſubmittebant ſeſe; nihilominus tamen Sanguinis uncias circiter 10, ad eum à ventriculi ſanguiferis vaſis avertendum ex vena in lævo brachio ſecta, nulla interpoſita mora, mitti jubeo; indè liquidi Helmontii *Laudani* guttas 15, 18 ve ex pimpinellæ minoris aquæ unciis quatuor ſumendas præſcribo; atque hujuſmodi remedium ſomni inducendi, & cruoris velocitatis retardandæ cauſa in uſum vocatum, ter, quaterve, quòd Sanguinis Vomitu redeunte rejiciebatur, ea nocte ad propoſitum mihi finem conſequendum repetere coactus ſum.

Vomitus vix horas duas ſub hiſce auxiliis conquievit: eo autem ſemel, iterumque reverſo, ex hæmorrhoidibus quoque Sanguinem ad uncias circiter quatuor educi præcipio, eodemque tempore ad quam gelidiſſimas, quæ aliàs feliciſſimè ceſſerant, optimèque nunc reſpondent in quadam Virgine profuſiſſimò Cruoris ex uteri vaſorum oppillationibus Vomitu ferè exinanita, ſorbitiones devenio: & primùm quidem ad *Chioccolatte*, tùm horis circiter quatuor exactis ad alios conglaciatos liquores, quos *Sorbetti* ex *Spuniglia*, & *Pappina*, vernacula Lingua hîc appellant. Ex cujuſmodi artificiali gelu concretis liquidis, nempè modò ex uno, modò ex altero ad coercendum Vomitum, vireſque reficiendas non multum quidem, ne ventriculum morbo ſolutum oneraret, ſed ſæpe Æger fermè exanimis deguſtabat. Hujuſmodi per ſummè gelidas ſorbitiones curandi ratione, Cruoris maximè gaſtricis Arteriis ac Venis contenti motum valentiſſimè refrenare potente, obtinui, ut Vomitus ad inſequentem uſque diem quieverit; in quo bis reverſus, iiſdem quam gelidiſſimis potionibus pertinaciter tertia, quartave quaque hora repetitis iterùm compreſſus eſt.

Tertio mali die, Sanguinem quidem, at non in multa copia, Nobiliſſimo Ægrotanti denuò circa veſperam vomenti catapotia auri bracteis obvoluta, ad accerſendum Somnum, & ad Cordis atque arteriarum coagitationes præternaturales compeſcendas, devoranda ex aquæ Tormentillæ herbæ ſucci unciis 3 dedi, quæ recipiebant perſici *Philonii* grana 30, toſti Opii ℈ß. Hæc autem adeò reſponderunt, ut, &

Vomitus protinus ſedatus ſit, & longiuſculus ſomnus noctu acceſſerit. Dum hæc adverſus Sanguinis Vomitionem gerebantur, alvus lacte, butyro, ſaccharo, ac ovi vitellis commiſtis, & in inferiores partes infuſis, ſecundo, tertiove die ad nigrum Sanguinem ex ventriculo ad inteſtina ſub bilis atræ ſpecie jam quoque delapſum evacuandum ducebatur ; aquaque prætereà ex Millefolii ſucco, in qua Cotoneum malum parumper ebullierat, glacie gelidiſſima reddita ad ſtomachum æſtu ſuo languidum erigendum, ad Ductus Sanguinem in eum importantes confirmandos, & ad ſitim, quæ die tertio urgere cœpit, moderandam ſæpius die, ac nocte, parcè tamen, ne Stomachus ipſe tunc multum admodum infirmus ad reſiſtendum obduretur, potui dabatur.

Dies 12° frigidiſſimam hanc, tenuiſſimamque victus rationem, ſub qua flatus quamplurimi per inferiora maximo cum crepitu deſcendebant, ſatis feliciter adhibui : poſt quod tempus, quum de ventriculi diſtendente dolore Ægrotus (quòd præmemorata glaciali aqua ad depellendam, qua continuò ardebat, ſitim abuſus eſſet) graviſſimè quereretur, illam dimiſi ; atque in ipſius locum ſubſtitui victum paulò pleniorem ex calidis gallinaceorum pullorum juſculis, in quibus recentis ovi vitellus cum permodica ſucci ex Limonio malo portione ſolutus erat. Quæ juſcula bis in die hauriebantur, interpoſita ſummis matutinis temporibus benè calida ex *Chioccolatte* ſorbitione, cui frigidæ aquæ potio, tùm ventriculi refrigerandi, tùm importunæ ſitis elidendæ ergò præmittebatur. Adverſus autem iſtiuſmodi permoleſtam ſtomachi diſtentionem præter calentes ſorbitiones, catapotia quoque modò propoſita inordinatos nervorum, & animalium Spirituum motus componendi virtute prædita propinavi.

Die 14° dolor, & tumor ponè ſiniſtram aurem ad inferioris mandibulæ medium, & amplus ſeſe exporrigens, poſteaquam caput proximè antecedentibus diebus leviter doluerat, extemplò ſuboritur ; eodemque tempore febris, quæ alioqui continens quidem, ſed nequaquam ingens erat cum levi frigore, & aliqua mentis turbatione intenditur. Contra quem dolorem calida, humidaque fomenta ex Vaccini lactis, & Aquæ ſimplicis, in quibus Sambuci flores decocti erant, partibus equalibus, ſpongiis admotis ſæpè repetenda præſcribo : per quæ humoris parotidam efficientis coitus intrà 8 dies ferè ex toto ſolutus eſt. Poſt quod tempus febricula circà noctem paulum increſcens, mane ſe remittens continuabat ; Æger ſiti non adeò cruciabatur, frigidam Nucerinam aquam potabat ; interdiu vigilabat, noctu conquieſcebat ; calidis, quas dixi, ſorbitionibus reficiabatur, & interdùm ptiſana quoque ex Oryza utebatur. Natura vel dum benè valebat ructuoſus, aliquando conquerebatur de quibuſdam (ut ipſe aiebat) acidis ventriculum irritantibus, pituitæ, & nonnunquam alimentorum rejectum moventibus : adverſus quæ Abſinthii tinctura ſemel die circà meridiem, ſæpiùs frigida aqua ex Nucerino Fonte huc importata haud improſperè pugnabam ; atque interdùm remediò

perſici *Philonii*, & toſti Opii; interdùm quam gelidiſſima ex lacte, & ſaccharo, gelu artificiosè concretis, ſorbitione ad crebrò ructantem, calidiſque fermentationibus (quod ut facilè credam, haud leves ſunt cauſæ) commotum ſtomachum componendum proſpero ſucceſſu, noctu utebar.

Circà diem quadrageſimum aquoſi humoris Vomitus decebat; Arteriæ naturaliter ordinatæ erant; venter quotidiè ſatis; copioſam verò urinam veſica reddebat; & vires, ac ciborum appetentia accedebant ſic, ut valentiorem cibum, frigidum videlicèt ex cervino cornu, & vitulinis pedibus gluten Convaleſcenti paulo antequam nutrientia juſcula ſupra commemorata ſorberet, quotidiè ter oporteret offerre. Ab ejuſmodi alimenti Genere primum ad Oryzam in capi juſculo coctam, & gallinacea jecinora elixa; indè ad tenerarum Gallinarum, Vitulorum, Coturnicumque carnes tranſiit: edullo ex Vaccino lacte, recentis ovi vitello, & tantilla ſacchari portione, ad cochlearium unum, aut alterum commanducato, alvi movendæ gratia. Atque in præſentia ſanus eſt, & bene valet.

Propoſitum Sanguinis Vomitum per conglaciatas quas recenſui ſorbitiones ſupprimendi rationem, quam ſolidiſſimis ratiocinationibus eſſe innixam, demonſtratu haud ità difficile eſt. Primùm namque ſanguiferi ductus Sanguinem in ventriculi cavum ſivè rapturâ, ſive eroſione, ſivè raritudine propriarum tunicarum, ſivè orum ſuorum aperturâ profundentes, glacialis ejuſmodi congelatarum celeriter in ventriculum defluentium potionum frigoris vi, nulla re interpoſita tacti, quaſique peruſti, quàm citiſſimè, validiſſimèque fieri poteſt, corrugantur; tùm Sanguis his ipſis Ductibus contentus vehementiſſimè cogitur, atque in majores canales repellitur; deindè toto corpore ob idem gelidiſſimum frigus inhorreſcente, reliquum Sanguinis in ſuis motibus lationis, & agitationis multum admodum retardatur, ac pro in ejus impetus ex Cordis, & Arteriarum pulſus velocitate enaſcens, arterioſorum, venoſorumque canalium extremis orificiis patefaciendis peropportunus notabiliter imminuitur; poſteà illæ ipſæ quam gelidiſſimæ potiones ex ſatis nutrientibus maſſulis coagmentatæ per notiſſimas chyli vias Sanguinis alveos influentes reſidui Cruoris particulas, congregando abſque ullo impetu reficiunt. Quum igitur, quam expono, adversùs Sanguinis Vomitum pugnandi ratio, & ventriculi vomendi conatus cohibere, & Sanguinem ſiſtere pluribus de nominibus valeat; ſubveniendique inſuper, & promptè quidem imbecillitati Ægrotantis ſufficienti virtute polleat: ecquis Saniorum ſaltem Medentium jam eſt, qui eam & maximè rationalem, & efficaciſſimarum in Cruorem vomentibus virium eſſe, non fateatur?

Animadverſio.

Bartholini de Nivis uſu Medico libellum nuperrimis diebus quum evolverem, inveni non Abenſinam modo potionem nive refrigeratam in calidis ventriculi paſſionibus imperare, ſed & Galenum. Hic, eodem referente Bartholino, Senecam, *ſolutum & æſtu ſuo languidum*

ſtomachum

ſtomachum perurente frigore erigendum eſſe, in Naturalibus quæſtionibus ſcribentem fortaſſe ſecutus : in ventriculo curando refrigerationem ſibi proponit per aquam, cibos, fructus nive refrigeratos. * *Vidiſti*, inquit, *& tu quoſdam uno die, vel potius hora, frigida potione levatos ; quorum aliis non aquam modo dedi fontanam recentem, ſed etiam quæ nive eſſet refrigerata, veluti Romæ præparare ſolent : cibos præterea ad eundem modum refrigeratos identidem me illis permittere vidiſti : iiſdem dedi, & ptiſanam probè coctam pari ratione refrigeratam, aliaque id genus ſexcenta.*

Præter Abenſinam, & Galenum, Rhaſem quoque Zacutum, Amatumque Luſitanos, Lud. Septalium, Laz. Riverium, atque alios, qui ad percalidum ventriculum multùm infrigidandum, colicoſque ex calidis, ac bilioſis humoribus coortos dolores depellendos cibo, & potu gelidio, & frigida aqua in linteolis ventri impoſita uſi ſunt, adducit idem Bartholinus qui autem Sanguinis rejectiones, effluentiaſve ex quacunque corporis noſtri parte, potionibus nive, vel glacie, quam frigidiſſimis redditis ; aut alius generis gelidiſſimis ſorbitionibus curarint, profert neminem. Quod ad me attinet : conglaciatos ex melonum ſeminum cremore, & modico Saccharo liquores parca manu circà primum veſperum oblatos ſatis fæliciter hiſce frigidiſſimis diebus expertus ſum in juvenilis ætatis, & fervidæ temperiei Moniali ; quæ ventriculi nervorum ſpaſmo ab vehementi moeſtitia ortum ducente, lævumque ejus orificium ità conſtringente, ut, & gravem, ſuſpirioſamque reſpirationem efficeret, & cùm eſculentorum, tùm potulentorum vel parciſſimè aſſumptorum deſcenſum penè ex toto prohiberet, graviter vexabatur.

Hippocrates, quanquam *frigida, veluti nivem, & glaciem Sanguinis Eruptiones inducere*, ſcribit Aphor. Sect. V. Aph. 24. nihilo tamen ſecius Aphor. 23. aſſerit : *in his frigida uti oportere, unde ſanguis eruptus, aut erupturus eſt, & quidem circà ipſas partes, unde fluit.* Memini, me ſex circiter abhinc annis, Sanguinis ingens ex utero profluvium, communibus medicamentis, & ne perfrigida quidem aqua quicquam proficientibus, promptiſſimè in Matrona, media æſtate ſuppreſſiſſe, perurente glacie genibus, & cruribus ſuper impoſita, cruralibus, & quod conſequitur, iliacis, aliiſque in uterum deſinentibus Arteriis, ac Venis maximopere coarctatis, repreſſoque propterea, ac veluti ab conſuetis viis intercluſo Sanguine.

Verumtamen, tametſi quam gelidiſſimas, ſorbitiones adversùs cujuſquemodi profluvia Sanguinis, & maximè ex ventriculo, ab immodico Sanguinei amnis fervore, & accelerato motu enata, aut cum his conjuncta, & in juvenibus potiſſimùm, quibus cruor, & ſtomachus exæſtuat, magnoperè collaudo : non ideò tamen ſuadere auſim, ut illæ ipſæ conglaciatæ ſorbitiones mulieribus Sanguinem ex partu vomentibus, aut frigidis ventriculi, atque inteſtinorum fermentationi-

* *Lib.* vii. *Met. Med. Cap.* iv.

bus

bus obnoxiis ſine ullo diſcrimine propinentur. In Sanguinis ex partu vomitionibus : uti neque *multa calida aqua lavarem*, neque *tepefactoria* (quemadmodum Hippocrates tùm in libro de Morbis Muliebribus, tùm in eo, quem de Natura Muliebri inſcripſit, indiſcriminatim præcipit) tàm facilè adhiberem : ſic aſininum, & vaccinum lac ab eodem Hippocrate iis in caſibus præſcriptum haud quaquam planè damnarem. Sanguinem, inquam, ex lochiorum ſuppreſſione, aut imminutione evomentibus ; primum venas in pedibus ſecari ad Sanguinem à ventriculo revocandum ; tùm calidis fomentis ex aqua, & albo vino, in quibus emollientes, aperienteſque herbæ ebullierint, hypogaſtricam regionem frequentiſſimè foveri, cruraque, & pedes eodem tempore multa calida aqua lavari juberem ad uteri vaſa reſeranda ; indè ad lac, humectandæ & reficiendæ ſanguineæ maſſæ cauſa, tranſirem. Sin verò mulieri ſanguinem vomendo rejicienti puerperii purgationes naturaliter fluerent, non calidis fotibus, & lavacris, ſed remediis Sanguinis impetum ſedantibus, ejus calorem cogendo moderantibus, confirmantibuſque vaſa ventriculi, ad ſingulas circumſtantes res attentè reſpiciendo, cruentum vomitum ſupprimere pertentarem. Eo autem compreſſo ad lacteam diætam, vel hac non conferente, ad reficientes portiones ex *Chioccolatte*, nutrientibus gallinaceorum pullorum, ranarum, terreſtriumve teſtudinum juſculis, atque horum ſimilibus devenirem.

VII. Vir annorum 24 caſtra ſecutus, anno 1706, ab inflicto in ſiniſtro hypochondrio vulnere, per hos 14 annos magnam portionem inteſtini coli, ictu hoc ſecti atque inverſi, ſpithamæ magnitudine è corpore prominentem gerit. *Part of the Colon hanging out through a Wound for* 14 *Years ; by* Abr. Vater, *M. D.* No. 366. *p.* 89.

Inteſtinum hoc, per vulnus in illud ſimul penetrans, egreſſum, interiorem ſuperficiem ad exteriora vertit, & ita in medio cohærens duas portiones efformat quarum altera verſus ſuperiora extenſa orificium monſtrat, quod ad inteſtina tenuia ſpectat, & fæces alvinas educit ; altera vero portio ad inferiora propendens orificium ad rectum apertum ita habet, ut Clyſterem injectum per anum reddat. In interiori ſuperficie, nunc ad extra vergente, glandulæ apparent copioſiſſimæ, albi ac cinerei coloris, verrucarum inſtar eminentes, & jucundiſſimum ſpectaculum exhibentes, quæ inclementius tactæ ſanguinem fundunt. Inteſtinum ita prominens nunquam totum regreditur intra abdomen ventriculo tamen vacuo quodammodo regreditur, illo autem pleno longius protruditur, imprimis ſpiritu retento. Utitur vir ille aqua gelidiſſima, imo glacie ac nive permiſta, ad abſtergendas ſordes, ſine ullo incommodi ſenſu ; fert etiam inteſtinum aërem frigidiſſimum ; ab eodem tamen intra ſe retrahitur & indureſcit, ac quodammodo palleſcit. Cibos omnis generis perferre poteſt iſte, fructus tamen recentes & olera cibis reliquis non miſcentur, ſed indigeſta exeunt, quemadmodum & juſcula ſine ſolidis cibis aſſumpta.

A B C D. Inteſtinum colon inverſum, ex vulnere prominens, & verſus ſuperiora & inferiora porrectum. *a.* Orificium ſuperius ad in- *Fig.* 81.

teſtina tenuia patens, per quod exeunt fæces alvinæ. *b.* Orificium inferius, quod ducit ad rectum, & Clyſterem per idem infuſum per anum reddit. *c*, *d.* Veſtigia vulneris à Chirurgo ampliati; per cujus medium adhuc apertum inteſtinum prominet. *e.* Umbilicus. *f*, *f*, *f.* Glandulæ copioſiſſimæ. *g.* Regio inguinalis. *h*, *h.* Dorſum. *i.* Coxendix. K. Regio Lumbaris.

A large Umbilical Rupture; *by* John Ranby, *Eſq*; *F. R. S.* N°. 421. p. 221.

VIII. About ſix Years ago, a Man gave his Wife a Kick on the Belly; and from that Time ſhe complained of Pain, and a Swelling about the *Navel*, which in Time encreaſed to about the Size of a Man's Head, ſeldom giving her any Uneaſineſs but by it's Weight; and that chiefly when her Bandage was off, which ſhe generally wore, except when her Diet, or any other Accident, brought on a *Diarrhœa*, which was always attended with Cholic Pains, particularly in the Rupture; to eaſe which, ſhe had been adviſed to iron it with a hot Iron, and had thereby ſo often burnt it, that there remained on the Skin ſeveral large *Cicatrix's*. Three Days before her Death ſhe was taken with the *Diarrhœa*, attended with a ſlight Fever.

On opening the Bag, the *Cawl* firſt preſented, the greateſt Part whereof adhered to the *Peritonæum:* On removing this, the *Small Guts*, to the Length of two Ells and a half, were contained in this *Bag*, together with all the *Colon*, except ſo much of it as is below the left *Kidney*; and the beginning of the *Colon*, with the *Cæcum*, were attached to the *Meſentery*, in ſuch a Manner, as to be but two Inches diſtant from the *Pylorus*; which, with about one Third of the *Stomach*, was by this Means drawn into the *Bag*. The Beginning of the *Duodenum* juſt entered the *Bag*, and then returned out again; which, with but a ſmall Portion of the *Jejunum*, was the chief that remained in the *Abdomen*.

A Child born with the Bowels hanging out of the Belly; *by* Claudius Amyand, *Eſq*; *F. R. S.* N°. 422. p. 258.

IX. *Dec.* 18th 1730, a Child was born with the greateſt Part of the Bowels hanging out of the Belly, by an Aperture about half an Inch in Diameter on the Right Side of the Navel String. The Birth was natural and eaſy.

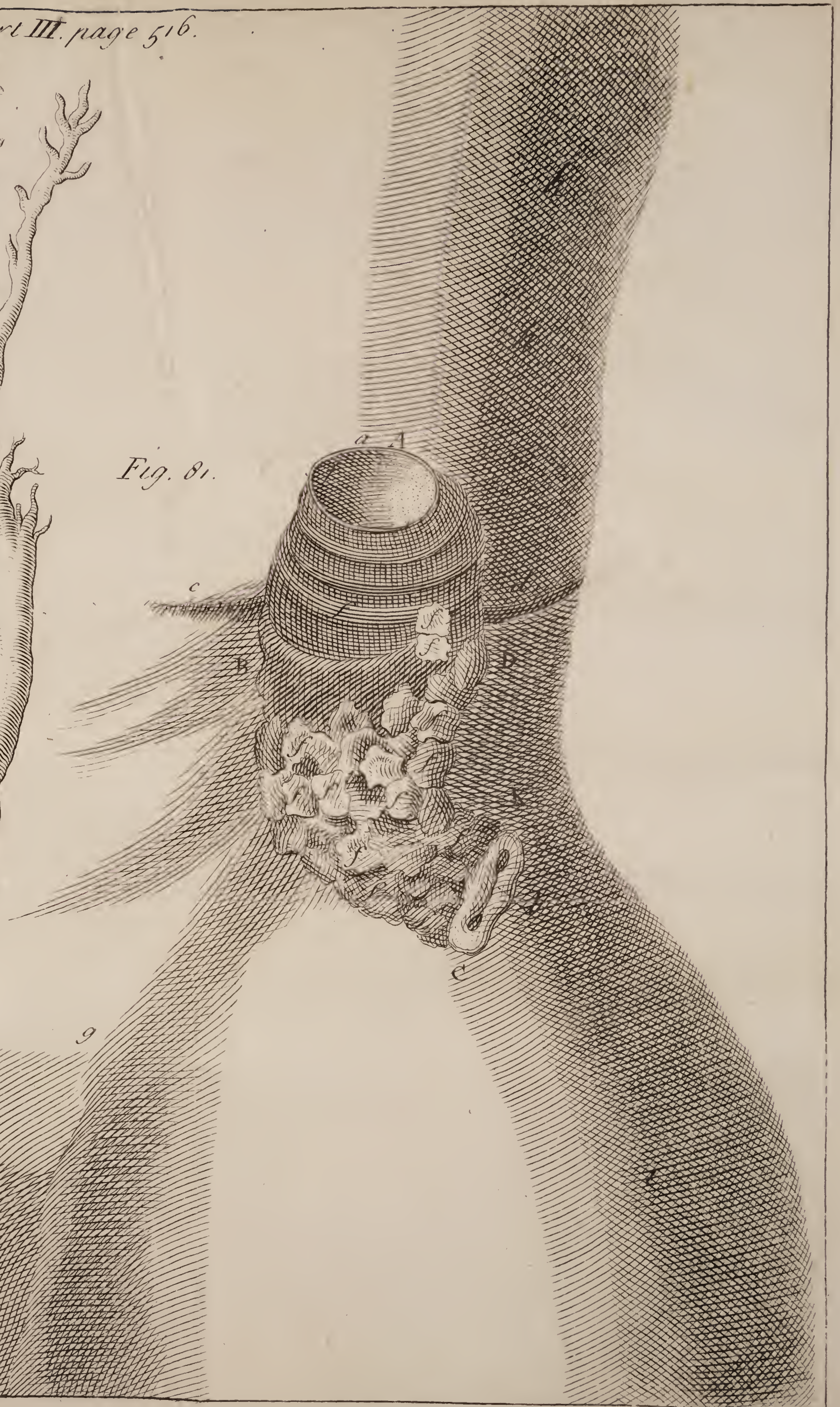
Being called, I found the Aperture lined with a Skin, and a Ligament that oppoſed the Reduction; the Parts livid, and tending to Mortification; yet the Child lived near three Days.

Upon opening, I found the *Prolapſus* to conſiſt of all the ſmall *Guts*, except the *Duodenum*, and of all the large ones, except of a ſmall Portion of the *Rectum*; the *Gall-Bladder* was about two Inches long, one half of which ſtood out of the *Abdomen*, and a ſmall Portion of the *Stomach:* All theſe were ſo coaleſced together, and confounded, that it was impoſſible to ſeparate them; though upon blowing, the Inteſtinal Pipe ſeemed to have it's uſual Length. The *Liver* was much thicker and larger than uſual, and convex in that Part of it, that is naturally concave: And the *Uterus* and *Bladder* preſſed on the left Side, by the Weight of the Bowels preſſing on the Right.

The

Fig. 80.

Fig. 81.



The Mother could aſcribe no Cauſe for this præter-natural Formation. The Child came at full Term, but it's Inquietudes for ſome Months before the Birth, made the Mother apprehend he was not well. Saving this, nothing extraordinary appeared.

A ſingular Sort of Cholic; by John Huxham, *M. D.* No. 422. p. 236.

X. Vir quidam quadragenarius, biliоſus, ſcorbuticus, diu multumque Colicis quibuſdam doloribus, inferiorem praecipue Abdominis regionem infeſtantibus, laboraverat, flatu porro perpetuo & moleſto. His biennium circiter, aut triennium ante mortem, acceſsêre dejectiones biliоſae, purulentae, foetidiſſimae cum ſtrigmentis ſaepe mucoſis, ſaepe ſanguineis; ita frequentes inſuper, ut perſaepe intra tres, quatuorve horas Alvus vel vicies ſolveretur, perſiſtente uſque Teneſmo: tandem quoque prodiêre. Carunculae fungoſae, lividae, tetrae, quarum aliquae magnitudinis ſaltem nucis myriſticae. At vero utcunque alvus citiſſime aegrotum plerunque exercebat; nonnunquam tamen, morbo preſertim ingruente, foret adſtricta valde cum horrendo tormento, nec niſi clyſtere ducta, aut catharticis irritata reſponderet. Subinde interea quaſi Famelicus oblata quaecunque voraret; ſubinde ne quidem Delicatula, vel ad Dapes exquiſitiſſimas nauſeanti, placerent: Aeger autem indies emacuit. Fuit illi urina parcior & ſemper biliоſa: Color vultûs luridus, ſaepe ſubflavus. Tam dira, tam longa mala infracto admodum fortique plane animo pertulit, donec ſupervenerunt demum Tumor pedum Oedematoſus, Delirium, facies *Hippocratica*, ſudor frigidus & oleoſus, certa mortis praenuncia.

Varia fuerunt à variis praeſcripta medicamina iiſque utique in arte exercitatiſſimis celeberrimiſque viris; ex Ipecacuana: ſcilicet *Emetica*, *ſtomachica*, *deobſtruentia*, *glutinantia*; *balſamica*, adſtringentia *Clyſmata* multifaria, omnigena, incaſſum omnia, ni quod Laudanum, ad breve tempus, foret miſero Solamen. Quid Aq; Briſtol. & Bath. Spadana & Pyrmont. quid obſtinata, quid accuratiſſima è Lacte & Vegetabili Diaeta potuerint inani omnino opera experiebatur; utut per breves aliquot dies paululum aliquando recreatus videretur.

Aperto abdomine perſpeximus Omentum conſumptum plane & putridum, Hepar praetumidum & *Schirroſis* Tuberculis, ſubalbidis, duris, refertum; Veſiculam felleam Bile ſubnigra ſemiplenam; totum Duodenum cum vicina Coli parte eodem Colore perfuſum: Pancreas maxime ſchirroſum: mediam Ilei partem ad quinque fere digitos inflammatam & ferme lividam Renes erant ſani ſatis, nec Glandulae meſentericae aeque *ſchirroſae* ac expectâſſemus. At quod maxime notandum pars Coli Inteſtini ſuprema, quam veteres Coecum nominârunt perperam (cum id potius ejuſdem Appendici, ab iiſdem ita nominatae, conveniat) in hocce Cadavere non, quod aſſolet, Reni dextro, ſeu potius internae Peritonaei Laminae Renem contegenti, adnexa fuit, mediante Appendice vermiculari; ſed in Pelvim delapſa tres circiter infra Tulpii Valvulam digitos cum ſuperiore parte Inteſtini recti firmiſſime concreverat: Porro levius adhaeſit Peritonaei Tunicae ſuper Ve-

ſicam urinariam expanſae, ſurſum inde reflexa, faciens cum ſuperiore Inteſtini parte (ſi ita dicam) angulum valde acutum ſub cavo dein Hepatis aſcendens & infra ventriculi fundum porrecta deſcendebat more ſolito & in Rectum deſinebat. Cum primum autem notavimus ambo Inteſtina & ſupra infraque adhaeſionem Gangraena affecta eſſe, ſuſpicantes hic latuiſſe fundamenta malorum, caute admodum lentaeque proceſſimus Scalpello imprimis aperiendo Rectum Inteſtinum, quod ubi factum, vidimus internam Tunicam *Sphacelatam* omnino nigram quaſi Atramento imbutam & maxime putidam; huic porro adhaerentes ſex, ſeptemve Carunculas ſubnigras, fungoſas, quarum minores magnitudine nucem avellanam aequabant. Perſcrutantes ulterius, Ulcus percepimus ex hoc Inteſtino in Colon, ubi cohaerebant penetrans, Digito mediocri facile patens: Inteſtina vero adeo putrida, ut vix tactum ferrent leviorem. Majorem Coli partem excrementis induratis obſervavimus infarctam, etſi plures liquidas Alvi dejectiones habuit, paulo ante mortem; tenuioribus nempe directe in Inteſtinum rectum per ulceratum orificium tranſeuntibus; ſolidioribus autem in Colo reſtantibus. Veſica urinaria fuit flaccida valde, intuſque muco ſubrufo oblita.

En fidam utique, licet minus elegantem morbi Hiſtoriam! En quid inciſo Corpore perſpectum! Ex quibus conjectura haud difficilis, quae fuit Cauſa morbi: Ex Anatomicis enim notum eſt, quod Concretio Inteſtinorum inter ſe aut cum Peritonaeo, motum periſtalticum minuit maxime. Vid. Cowperi Anatomiam Explic. Tab. 34. Unde ad Locum Conglutinationis tarda admodum debiliſque Excrementorum Impulſio, eorundem Congeſtio, Remora ſequentibus; forte duris & acutis laedentibus, qualia Oſſa Prunorum deglutita, aut tale quid; forte acribus & bilioſis Humoribus non ſatis valide motu vermiculari propulſis, ſed ad Angulum Coli acutum ſubſiſtentibus; exinde aut Inteſtini Inflammatio, aut Corroſio, Ulcus denique ſequebantur; tandemque, in Homine valde *Cachectico*, Gangraena.

A vaſt Omentum; *by the ſame.* N° 382. p. 60.

XI. Veterani cujuſdam Militis uxor dolore colico & vomitu diu laboraverat, quibus ſupervenit ventris tumor durus, qui auctus indies magnam in molem excrevit. Jam evomuntur omnia, bilis atra, ſincera, tandem & ipſae foeces alvinae. Dolor vero perſaepe immanis in ſiniſtro praeſertim hypochondrio, fotus, cathartica, enemata, anodyna, plurima a Pharmacopoeio adhibentur; incaſſum omnia; permanet dolor, increſſit uſque tumor, digitorum preſſui haud magis cedens quam ſi lignum fuiſſet. Ex hocce tumore plura quaſi tubera enata ſunt, quorum unum alterumve caput puerile, alia pugnum virilem, magnitudine aequabant: eminebat autem maximum in ſiniſtro hypochondrio, ubi graviſſimum perſenſit dolorem, ita ut ſaepius exclamaverit ſe voluiſſe tumorem ibidem loci fore perfoſſum. Increſcente tumore facta eſt valde dyſpnoica. Tanta tamque atrocia per menſes fere 14 perpeſſa fuerat mulier, cum tandem grata venit morborum requies, mors.

Nudato

Nudato cadavere montoſum obſervavimus ventrem; reliquum vero corpus ſumma macie confectum. Secto abdomine in conſpectum ſe dedit ingens quaſi ſebi maſſa (niſi quod colore fuit minus alba) totum ventris cavum adimplens, ita ut nec ventriculus, nec jecur, neque inteſtina apparerent ulla; adhaeſerat enim omentum hoc enorme peritonaeo pluribus in locis, in utroque praeſertim hypochondrio, ubi & latior & firmior fuit cohaerentia. Secto autem in modum crucis peritonæo, & ab omento ſeparato, conſpeximus illum in pelvim fere detruſum, omentum etiam toti jecinoris cavo annexum, ventriculum hac mole oppreſſum, uti & duodenum, colon & jejunum: cum adipoſo renum involucro (ſiniſtro praecipue) connexum & quaſi confuſum fuit; adeo ut colon, altius paulo quam in rectum deſinit, ſebo hocce concreto fuit penitus involutum, hinc foecibus praecluſum iter, hinc dolores illi ſaeviſſimi, quibus ante mortem excruciata fuerat mulier: & ut hic obiter notem, per plures dies ante mortem nec ſua ſponte nec vel clyſmatibus acerrimis irritata alvus foeces dejecerat ullas.

His luſtratis ingens ſeparavimus omentum à jecore, ventriculo, ſchirroſo pancreate, inteſtinis, tandem & à meſenterio, & ab interna peritonaei lamina renibus inſtrata. Splen fuit hac maſſa quodam modo demerſus, contractior & quaſi coriaceus.

Pendebat omentum hocce ℔ xvi ½ *Avoird.* nec tamen abſtulimus unam ſaltem alteramve libram partibus adhaerentem. Pondus hercle maximum! Si conſideramus ex obeſiore homine omentum vix libras pendere tres, majus certe inveni antehac nunquam, quanquam & ſecui & diſſexta vidi plurima hominum cadavera. Fateor equidem longe majus à *Gregorio Horſtio* in ſuis obſervat. memoratum fuiſſe, majus etiam in Ephemerid. *German.* ann. x. veruntamen hoc quoque noſtrum monſtris annumerari merito debet.

Hujus & in extima parte, nec non in interiore ſubſtantia, plura obſervavi vaſa ſanguinea, eaque certe maxime dilata, quorum aliqua penna anſerina majora, aliqua vero quaſi in aneuriſmatibus terminantia. Ex horum aneuriſmatum (ſi ita dicam) maximo uncias circiter ſex nigricantis ſanguinis extraxi cum quibuſdam grumis albidioribus; anne adipis particulae à venis epiploicis abſorptae atque morbo congelatae?

Ex plurimis lobis conflari mihi videbatur maſſa haecce, ſibi invicem arcte haerentibus; aliquos tamen ſeparavi, quorum pauci pomo minori fuere magnitudine aequales, forma haud abſimiles. Media hujus pars, caetera durior, cultro haud facile cedebat.

In iſthoc cadavere ſequentia etiam fuere obſervatu digniora. Inferior hepatis pars in ſchirrum abierat. Ex veſica fellea plures exemi calculos, carbonem foſſilem colore referentes, friabiles, aquam innatantes, quos bilem haud improprie nominares ſplendidam; his quippe quum inerant plurimae particulae micantes, haud dubio ſalinae.

Meſenterii glandulae fuere ſchirroſae, imo quaedam in ſubſtantiam pene lapideam induratae. Inteſtina tenuia fuere inflammata, colon cum coeco fere totum gangrena correptum, etiam proceſſus ipſe vermicularis.

Ren uterque fuit ſanus ſatis: dexter autem emiſit ureteres duos: cum vero renem diſſecuiſſem, percepi facile, quid eſſet in cauſa, cur ureter hic fuit duplex. Renis enim pelvis ſepto quodam fuit diviſa, digitum tranſverſum craſſo, ejuſdem perfectè ſubſtantiae cum reliquo renis parenchymate. Hic fuit ren quaſi duplex, cui duplex pelvis, ureterque duplex. Erant in imo abdomine feri ſubcruenti librae quaſi duae. Malum hoc immedicabile penitus viſum eſt, niſi quis morbi principiis obſtitiſſet.

Stones voided per Anum; *by Mr.* David Martineau *Surgeon in* Norwich. N° 380. p. 433.

XII. Theſe Stones were voided by a poor Woman, *per Anum*, on the 26th, 27th, and 28th of *March* 1723; who was then pregnant about the 11th or 12th Week, according to Computation. I was called in the Night on the 23d, when, in Appearance, ſhe was in the Extremity of a Convulſion Fit, attended with violent Vomitings; on the ceaſing of which, ſhe complained of great Pain in her Back, from her Reins downward to the *Anus*; whereupon I blooded her, ordered ſome *Anti-Emetics*, and left her: She continued with much Pain the whole Day; on the 24th, in the Night, her Fits returned with double Force: her Pains alſo increaſing like unto Labour-Pains, put me upon farther Enquiry, but nothing appeared more than ordinary: The Extremity of Pain drove me to the Uſe of Glyſters; which was attempted, but none could be thrown up, altho' repeated by ſome of the moſt experienced Nurſes; upon which, I gave her a gentle Draught, which ſhe obſerved increaſed her Pain with a ſtrong *Teneſmus*, that continued near three Hours before the largeſt Stone appeared; which ſtopped at the upper Part A, D, *Fig.* 82, but was quickly removed by preſſing the lower Protuberance C; upon which, with a plentiful Diſcharge, ſhe had Eaſe, ſlept ſome Hours, waking with a Deſire to Stool, and voided with it the 2d and 3d; and the next Day, at four Hours diſtance, the other two. She recovered perfectly, and was delivered of a very fine living Girl, on the 24th of *Auguſt* paſt. Upon Inquiry, it ſeems, ſhe had been frequently troubled, for fourteen Years paſt, with Pains in her Side and Stomach without Vomitings; which is all ſhe remembers.

Fig. 82.

The Largeneſs of the Stones, their Seat and Subſtance, is what to me ſeems worthy Speculation, they being all alike in Colour and Weight, according to their Dimenſions, is the Reaſon I broke but one.

	Wt. of the Stones.			Their Dimensions in Circumference.					
	oz.	*dwts.*	*gr.*		*Inch.*			*Inch.*	
Fig. 82.	2	16	12	A. B. C. D.	8	A D.	the Top of the Stone Oval.	$6\frac{5}{8}$	*Fig.* 82.
Fig. 83.		8	12	E. F. G. H.	$5\frac{1}{8}$		E. G.	$4\frac{5}{8}$	*Fig.* 83.
Fig. 84.		7	3	I. K. L. M.	5		I. L.	$3\frac{5}{8}$	*Fig.* 84.
Fig. 85.		7	12	N. O. P. Q.	$4\frac{6}{8}$		N. P.	$3\frac{7}{8}$	*Fig.* 85.
Fig. 86.		5	13	R. S. T. U.	$4\frac{3}{8}$		R. T.	$4\frac{1}{8}$	*Fig.* 86.

Fig. 87. A Shell taken off the Stone at the End 2. The Stone and Shell being like a Chesnut, soft, and like Wool, cutting into the Stone at 3; I found it hard. *Fig.* 87.

A Fork put up the Anus, *that was afterwards drawn out thro' the Buttock; by Mr.* Robert Payne, *Surgeon at* Lowestofft. N° 391. p. 408

XIII. An Apprentice to a Ship-Carpenter in *Great Yarmouth*, about 19 Years of Age, had violent Pains in the lower Part of the *Abdomen*, for 6 or 7 Months: It did not appear to be any Species of the Cholic; he sometimes made bloody Urine, which induced me to believe it might be a Stone in the Bladder. He was very little relieved by Physic: At length, a hard Tumour appeared in the left Buttock, on or near the *Glutæus Maximus*, two or three Inches from the Verge of the *Anus*, a little sloping upwards. A short time after he voided purulent Matter by the *Anus*, every Day for some Time: The Tumor broke: I suspected a Fistula *in Ano*, but could not get the Probe, by the Orifice of the Sore, into the *Rectum*. Shortly after, the Prongs of a Fork appeared thro' the Orifice of the Sore above half an Inch beyond the Skin, whereupon his violent Pains ceased. I divided the Flesh between the Prongs, according to the best of my Judgment; and after that made a circular Incision about the Prongs, and so with a strong Pair of Pincers extracted it, not without great Difficulty, Handle and all entire: The End of the Handle was besmeared with the Excrement, when I drew it out: It is six Inches and a half long, a large Pocket Fork; the Handle is Ivory, but is died of a very dark-brown Colour; the Iron Part is very black and smooth, but not rusty. He is likely to do well in a short Time; the Operation being performed the 11th of *October* last. He would not own how it came, till a Relation of his, on whom, in a great measure, his Dependance is, threatned never to look upon him more, unless he would give him an Account how it came: And he told him, that, being costive, he put the Fork up his Fundament, thinking by that Means to help himself, but unfortunately slipt up so far, that he could not recover it again. He says he had no Trouble or Pain, till a Month, or more, after it was put up.

XIV. A

Two uncommon Cases of Tumours of the Abdomen; *by* John Boecler, *M. D. translated from the printed Book in* Latin, *by* W. Rutty, *M. D. R. S. Secr.* No. 405. p. 562.

XIV. A Woman of *Straſburgh*, of 32 Years of Age, after an immature and haſty Labour, had her Belly grew gradually for ten Years together. During the whole Time of Geſtation, ſhe complained of ſcarcely any other Symptom than the Weight and Heavineſs of her Belly; only now and then of a tenſe Pain and Difficulty in Reſpiration: She ſaid nevertheleſs, that Flatuſes would ſometimes be diſcharged from the *Pudenda*; and the more they were ſo, the leſs Uneaſineſs ſhe perceived. The *Menſtrua* were regular as to Time; but as to Quantity ſhe did not explain herſelf: In the latter Months, towards her Death, ſhe grew plainly cachectic. Her Countenance was cadaverous; her Breaſt and upper Limbs perfectly emaciated; her Feet oedematous, and the Belly much more turgid and prominent than before; ſo that at length ſhe breathed with the utmoſt Difficulty, and upon taking any Nouriſhment, complained of a great Straitneſs in her Cheſt. Upon opening the *Abdomen*, two Days after her Death, ſome Water flowed out, of a wheyiſh Colour, tho' in what Quantity was not taken Notice of; but upon dividing the *Uterus*, a plentiful Quantity of a bloody Liquor iſſued from it, together with ſeventy-two *Molæ* of different Figures and Solidity, and chiefly of a black Colour. One only, the 76th, was fixed to the lower Part of the right Side of the *Uterus*, contiguous to it's internal Orifice. Theſe ſolid Subſtances weighed 64 Ounces; as the Liquor alſo filled fifteen ancient *Alſace* Meaſures, ſo that taken together, the whole weighed 80 Pounds Apothecaries Weight. The Skin of the *Abdomen* was very thin, and almoſt tranſparent; the Navel perfectly obliterated; the Fat almoſt entirely conſumed; the Muſcles pale, flaccid, and very thin, and the *Peritonæum* in ſome Places ſo ſtrongly attached to the *Uterus*, that it could not, without the utmoſt Difficulty, be torn from it. The Body of the *Uterus*, which is naturally thick, was extenuated to the ſame Degree of Rarity and Tranſparency with that of the *Cutis* of the *Abdomen*, and of a ſurpriſing Capacity. The Liver appeared pale, and ſo flaccid that it might be eaſily rubbed to pieces. The Height of the Belly from the Vertebræ of the Loins to the Navel meaſured $1\frac{1}{2}$ Foot; it's Length from the *Cartilago enſiformis* to the *Pudenda* $2\frac{1}{2}$ Feet; and it's Circumference at the Waiſt, 4 Feet $2\frac{1}{2}$ Inches, tho' the Woman was naturally of a ſmall Size and Stature.

A Maid-ſervant in the ſame City, of twenty-three Years of Age, from a Suppreſſion of the *Menſtrua*, had her Belly grow ſlowly for three Years, without any other notable Diſorder; till upon an accidental Fall, it increaſed ſo much in ſix Days, as to obliterate the Navel; and not being capable of a farther Diſtention, part of the Matter which cauſed the Tumefaction, flowed down to the Legs and ſwelled them likewiſe; which brought on a Difficulty of Breathing, a ſmall, frequent, and uneaſy Pulſe, with a total Loſs of Appetite. But what was more remarkable, the *Syſtole* and *Diaſtole* of the Heart were plainly felt under the left Clavicle, the Heart being, upon Diſ-

ſection,

Fig. 82.

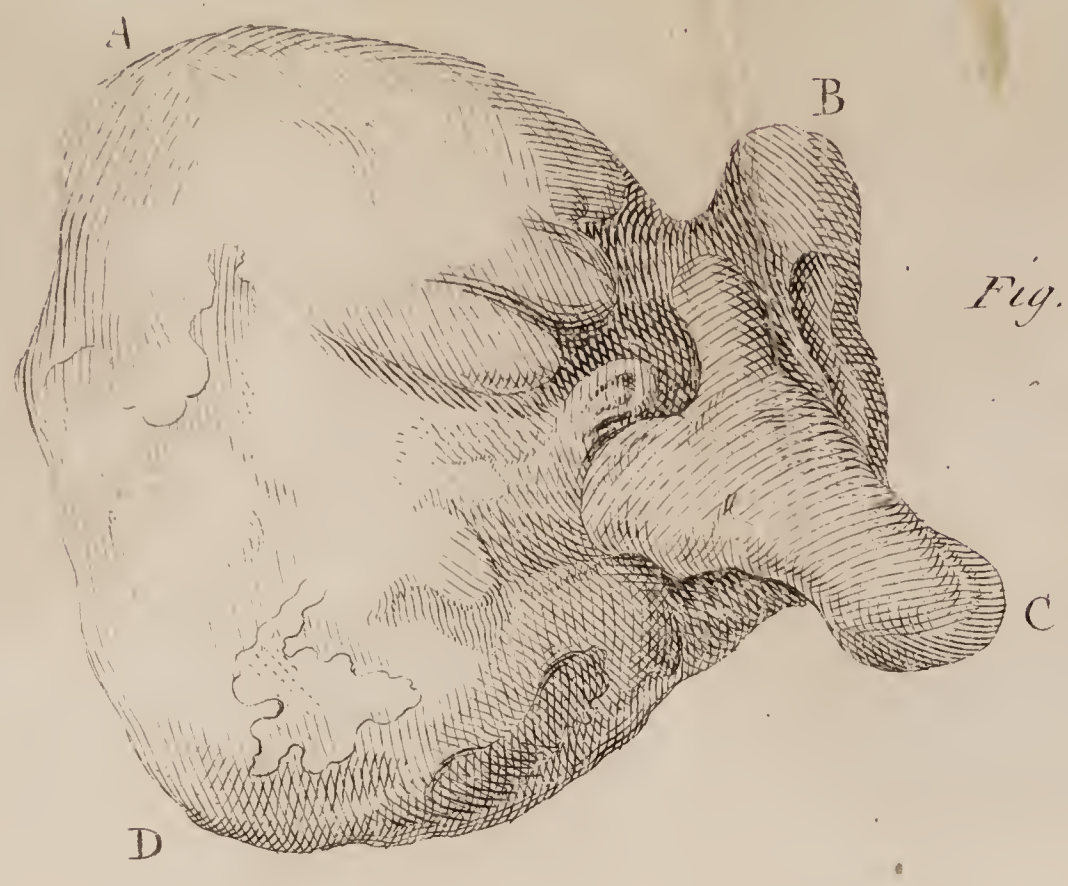


Fig. 83.

Fig. 84.

Fig. 85.

Fig. 86.

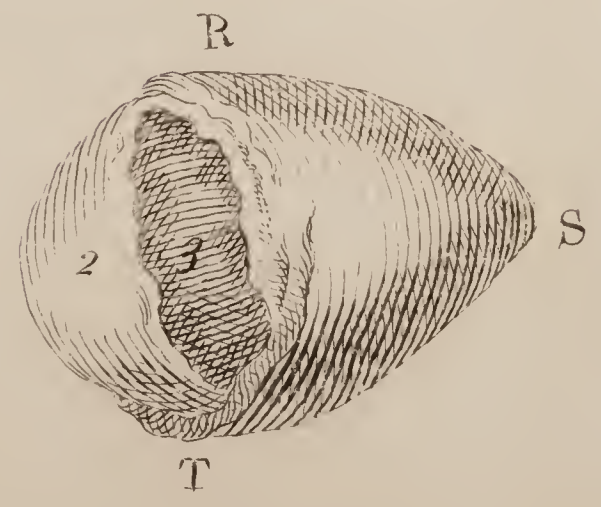
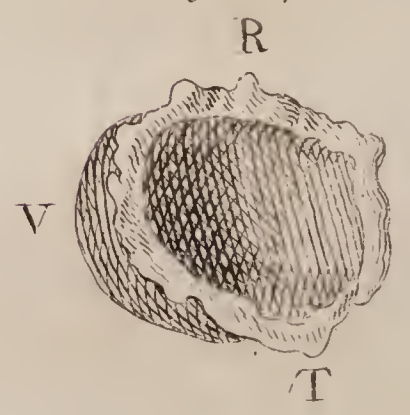


Fig. 87.



Toms Sculp.

ſection, found thruſt up to that Part of the *Thorax*. The 14th Day from the Fall, a *Diarrhœa* came on, which killed her in a few Days. Upon making a ſmall Inciſion in the right *Hypochondrium*, there guſhed out from the Cavity a Liquor, in Colour, Conſiſtence, and Froth, reſembling well boiled Beer; which upon enlarging the Inciſion, was followed by a fœtid purulent Matter, with Portions of the putrified Caul, which Matter filled 56 *Straſburgh* Pints. Upon this, the Belly ſubſided; but a large ſolid Subſtance ſtill remained under the containing Parts of the *Abdomen*. Opening therefore the whole Cavity, there was found under the left Groin a conſiderable Tumour, nouriſhed by it's proper Veſſels, and every where fixed to the circumjacent Membranes; which being freed from, it weighed ſix Pounds common Weight. This Tumour proved a Congeries of incyſtated Abceſſes (wrapt up in one common Covering) of different Sizes; the largeſt as big as a Man's two Fiſts, the ſmalleſt the Size of an Egg; and each of a different Sort of Subſtance: Beſides which was a great Number of *Hydatides*. The *Peritonæum* was as thick as the *Cutis*; the Caul almoſt entirely deſtroyed; the Stomach natural, but perfectly empty; the Guts livid, very much thickened and vaſtly inflated, and moreover connected preternaturally to each other by peculiar Membranes. The Liver ſtrongly adhered to the right *Hypochondrium*, and it's Coat parted from it's *Parenchyma* almoſt ſpontaneouſly. The left Kidney very near equalled the Spleen in Bulk, and the *Pancreas* was as hard as a Cartilage; but the *Uterus* and Bladder were found in *ſtatu ſano*. The Cavity of the *Thorax* was much ſmaller than uſual, from the Contents of the *Abdomen* preſſing up the *Diaphragm* into it; in which Cavity alſo was found the ſame Sort of bloody putrid Liquor, as likewiſe in the *Pericardium*. The right Ventricle of the Heart was preternaturally ſoft and flaccid, and being opened, was lined with *Hydatides*. The upper Parts of the Body were emaciated; the lower much tumefied by the Water contained within them.

A great Number of Hydatides *found in the* Abdomen; *by* Barthol. Anhorn ab Hartuiſs. N° 370. *p.* 17.

XV. Rhedarius Baronis de Penterrider, aetatis 58 annorum, Temperamenti ſic dicti Cholerico Phlegmatici, Staturae quadratae, non obeſus ſed robuſtus, bene appetens, officio ſuo bene fungens, nec vino, nec liquoribus ſpirituoſis immoderatè utens, bono ſatis Regimine vivens Auguſti Menſe 1721, auxilium meum petiit, pro Abdomine fortiter tumente & tenſo, Aſcitico minimè abſimili, urinâ attamen bonae notae & in quantitate ſufficiente optimè prodeunte, pedum nullo oedemate comparente, Reſpiratione liberrimè procedente ventre autem in dies creſcente (qui Menſe Junio tumere incepit) ſanguine in vaſis hæmorrhoidalibus ſtagnante, nodos ibidem magnos elevante & interdum dolorificè furente, Appetitu ac Viribus nunquam proſtratis.

Fateor Aenigma mihi fuiſſe an Tumor ſit ſiccus humiduſne? Ad ſatisfaciendum verò Indicationibus, in ſpecie haemorrhoidibus ſuppreſſis,

medicamenta chalybeata cum Purgantibus mixta exhibui, per quae fluxus haemorrhoidum mox excitatus, dolores ſedati, & magna ſordium quantitas cum aliquali levamine per tubulum inteſtinalem fuit eliminata. Poſtea ad exemplum Etmulleri in hydrope ſicco, Nitr. praeparat. quotidie ad ʒ ſs. item Mercurium vitae & omnis generis Diuretica mitiora, fortiora, &c. omnia incaſſum dedi.

Abhinc Aeger ſub ſanitatis recuperandae, ſpe, pro more Vulgi auxilium Empiricorum imploravit, qui ſtatim Aureos ipſi montes promiſerunt, multiſque ſaginatum Arcanis miſerum in malis deſeruerunt.

Abdomine igitur mole ſuâ maximè urgente, ad Paracenteſin ſine morâ progrediendum erat; quam die 14 Jan. Chirurgus unanimi noſtro conſenſu adminiſtravit; contenta verò conſiſtentiam gelatinoſam nacta per anguſtius Cannulae immiſſae ſpatium exire non poterant. Inciſio ergo cum Lancetta facienda erat; quâ factâ, materia gelatinoſa coloris griſei & lutei, albumine ovorum ſpiſſior, cum magna quantitate globulorum alborum ſphaericorum, triangularium, vermicularium, gemellorum, teſticuli, & ovarii-formium, &c. magnitudinem nucis avellanae adaequantium primo die ad menſuras ſex evacuata erat, aegro quantum ad vires optimè ſe habente. Poſtero die, cum facile judicare licebat, factam inciſionem non ſatis eſſe amplam pro exitu majoribus hujus naturae globulis concedendo, Lancettâ igitur vulnus ampliabatur, per quod globuli ovum Columbinum magnitudine ſuperantes magno numero cum ſex iterum gelatinae menſuris, & magno fruſto maſſae cujuſdam albae portionem omenti referentis, de novo excreti erant. Cui Maſſae plures dictorum globulorum filamentis fibroſis adhaereſcebant.

In examinatione materiarum, gelatina ſuper carbonum ignem indureſcit & albeſcit, pelliculâ deſuper ſe formante.

Spiritu Vitrioli, Spir. Sal. Ammon. vol. Ol. Tart. per deliq. Spir. Vin. rectif. Aceto affuſis, manifeſti nihil videtur, quàm levis induratio materiae ab uno quoque iſtorum liquorum, etſi naturâ inter ſe invicem contrariorum.

Globuli coloris ſunt albiſſimi, ſenſui tactûs reſiſtentes; rupti liquorem album chylo ſimilem fundunt, membranâ ſeu pelliculâ manifeſtâ cincti.

Maſſa iſta albicans quae portionem omenti refert, etſi craſſitie pollicem adaequet, ſubſtantiam purè membranaceam habet.

Numerus globulorum majorum & minorum ad ſeptem vel octo millia ſe extendit.

Hodie qui eſt incluſivè decimus ſextus ab operatione dies, aeger quàm optimè ſe habet, venter eſt mollis, planus, vulnus pulcherrimum, urina, pulſus, reſpiratio bona, conſequenter nulla febris, ſomnus tranquillus. Evacuatio materiae gelatinoſae durantibus 13 diebus fuit copioſa, inodora, nunc purè ſeroſa & parca, ſed fortem odorem

ſpirans,

ſpirans, immiſſumque Catheterem argenteum nigricans, quod corporibus heterogeneis corruptis magis quàm viſceribus gangraenâ prehenſis attribuimus, quoniam febris abeſt. Hodie poſt injectionem Decocti ex Enula Campan. Agrimon. & Mell. cum Tinctur. Aloes. Myrrh. & Balſam. du Commandeur, rupti pellicula globuli fuit excreta, quem in ſtatu ſuo naturali ovum gallinaceum mole adaequâſſe, forſan ſuperâſſe, certum eſt.

Appetitus & vires nunc ſunt quae nobis faceſſunt. Medicamenta porrigo Traumatica. Alexiteria & Confortantia invicem combinata juxta victum Analepticum.

XVI. Ever ſince I was Anatomiſt and Surgeon enough, to reaſon upon the Cauſes of the Tedioufneſs and bad Succeſs of the common Methods of Cutting for the Stone, I concluded that they were principally owing to the natural Structure and Situation of the Parts concerned. Therefore I began to conſider why that Operation might not be performed the high Way, ſo frequently mentioned by Authors, but never approved of by any, except the moſt ſagacious of all Surgeons, *Fr. Roſſetus*, who has certainly been very little read, or elſe very ill underſtood, otherwiſe this Operation had not been ſo long a Secret. After making ſome Experiments on dead Bodies, I was convinced, that the Stone might be extracted that Way with a great deal leſs Trouble than commonly; and I was perſwaded that the Wound would heal again, by the great Number of authentic Inſtances we have of accidental Wounds in the ſame Place being ſpeedily and firmly cured; and therefore I reſolved to make the Experiment on the firſt Patient I could meet with, which I could not procure till *Deceæber* 1719; and then I proceeded as follows.

An Account of the new Method of cutting for the Stone; by J. Douglas, *Surgeon, F. R. S.* N° 371. *p.* 83.

The Patient was placed flat on his Back, on a Table, with a Pillow under his Head; then his Wriſts and Ancles were faſtened together, with Straps: Then I ordered one Aſſiſtant to his Head, another to each of his Shoulders, two to the *Penis*, one of which was to manage the Ligature, and the other the Prepuce, and one to each Knee, to hold them as faſt and firm as poſſible. The Patient and Aſſiſtants being thus placed, the Operation conſiſts of three Parts.

1*ſt*, In filling the Bladder, which is done thus: Paſs the *Catheter*, *Fig.* 88, then draw out the Stillet, *Fig.* 89, then order the Ligature Aſſiſtant to caſt the Ligature, which is a Skein of Silk, round the *Penis*, above the Glans. Then fix the Key, *Fig.* 90, to the Head of the *Catheter*, *Fig.* 91, to keep it ſteady, while you ſcrew on the Syringe, *Fig.* 92; then ſcrew the ſecond part of the Sucking-Pipe, *Fig.* 93, to the firſt, *Fig.* 94. Then order the *Penis* Ligature to be ſtraitened, and the Prepuce Aſſiſtant to gather the Prepuce up about the *Catheter*, and to hold it as cloſe as poſſible. Then order the Water, being a little warmer than Milk, to be clapped under the Sucking Pipe, then draw up the Water into the Syringe, and thruſt it into the Bladder at leiſure, and repeat it till the Bladder is ſo full, that you can perceive

Fig. 88, 89. *Fig.* 90. *Fig.* 91. *Fig.* 92, 93. *Fig.* 94.

ceive it's Tumour through the *Abdomen*, (at which Time you will alſo obſerve the *Penis* above, and the Prepuce below the Ligature, very much ſwelled, and the Patient in a great deal of Pain) which is a certain Sign that there is enough injected; then withdraw your Syringe and *Catheter* together, taking particular Care that your *Penis* Aſſiſtants ſtraiten their Gripe, leſt the Water ſhould follow the *Catheter*, which would undo all.

2*dly*, In making the Inciſion, which is done thus: Order the *Penis* Aſſiſtants to turn the *Penis* towards the *Anus*, that ſo their Hands may be the more out of the way; then take the firſt Knife, *Fig.* 95, and cut at leiſure, and with a ſteady Hand, from near the upper Part of the Tumour of the Bladder, or lower, according to the computed Bigneſs of the Stone, down to the *Os Pubis*, and exactly in the middle; when you are got a little more than half way through the abdominal Muſcles, take the ſecond Knife, *Fig.* 96, clap it's Back on the middle of the *Os Pubis*, then run it's Point down towards the *Sphincter*, until you get into the Cavity of the Bladder, which is diſcovered by iſſuing out of the Water, then run your Knife along very quickly towards the Fund of Bladder, as far as is neceſſary.

Fig. 95.

Fig. 96.

3*dly*, In extracting the Stone, which is done thus: Before you withdraw your Knife, introduce the fore and middle Fingers of your left Hand, between the Knife and the *Os Pubis*, into the Bladder; then withdraw your Knife, and thruſt the fore and middle Fingers of your right Hand into the *Anus*, and raiſe the Stone up towards the Wound, and ſo you will eaſily catch hold of it, (tho' never ſo ſmall) with your Fingers which are in the Bladder; then draw it out with the ſmalleſt End foremoſt: Then introduce your Fingers again, to ſee if there are any more Stones, which are to be drawn out as before.

Then take a Needle and Thread, and make one Stitch thro' the Skin, in the middle of the Wound, and tie it pretty cloſe, then undo the Straps and carry the Patient to Bed.

The Patient being put to bed, I laid a Pledget, armed with Balſam, over the Wound, and a bit of ſticking Plaiſter over that. Then I embrocated all the *Abdomen*, *Scrotum*, and *Penis*, with warm *Ol. Chamæmel.*; then I applied over the Dreſſing and all the *Abdomen* an *Emollient Pultice*, ſpread almoſt an Inch thick on ſoft Flannel; then I turned a Swath a little broader than the Patient's Hand once round about him, and pinned it on the Pultice Cloth, juſt tight enough to keep it on.

As ſoon as he was dreſſed, I gave him an Opiate (for nothing is ſo proper as Reſt) ſuch as this; ℞ *Aq. Cinnam. Hord.* ℥ij. *Laud. Liq. Gutt.* xv. *Syr. de Mecon.* ℥ij. which may be increaſed or diminiſhed as the Caſe requires.

Next

Fig. 94.

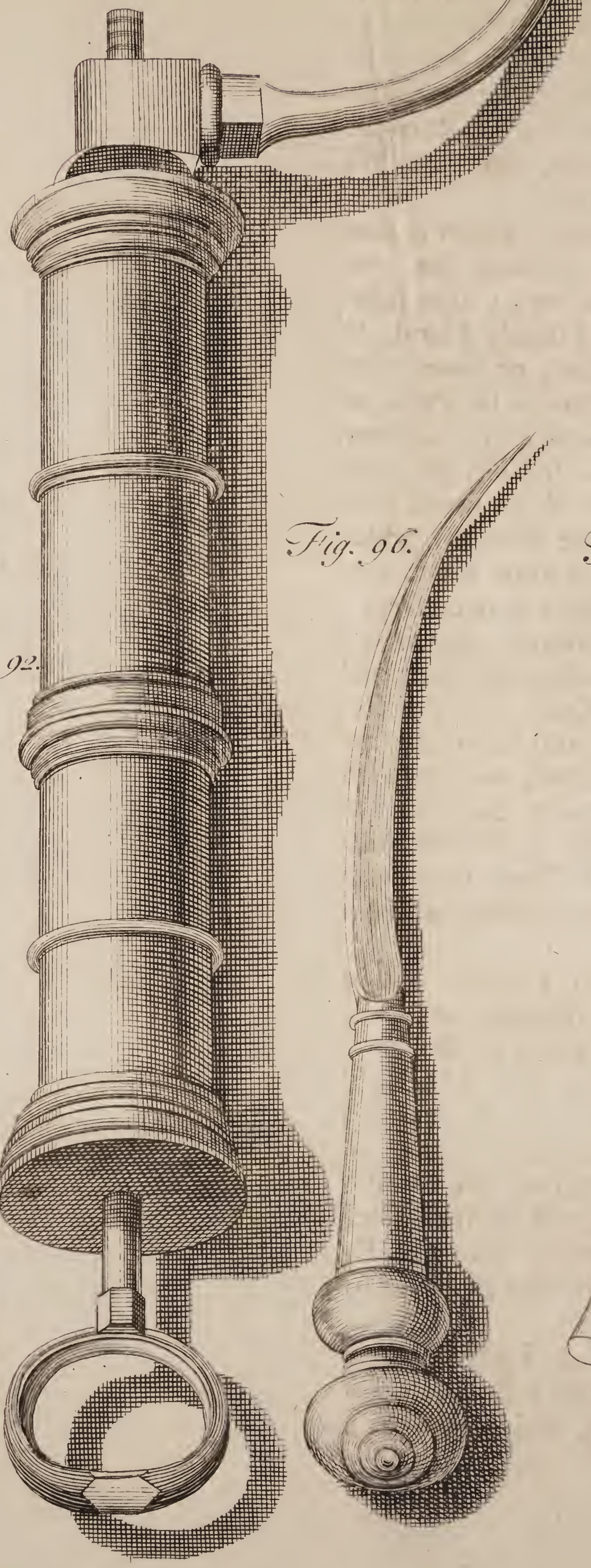


Fig. 89.

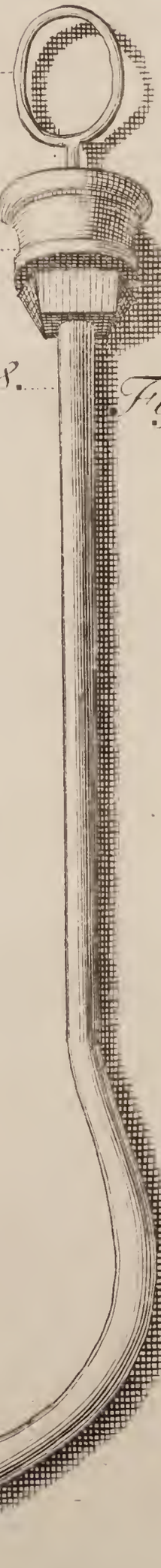


Fig. 91.

Fig. 88.

Fig. 92.

Fig. 90.

Fig. 96.

Fig. 93.

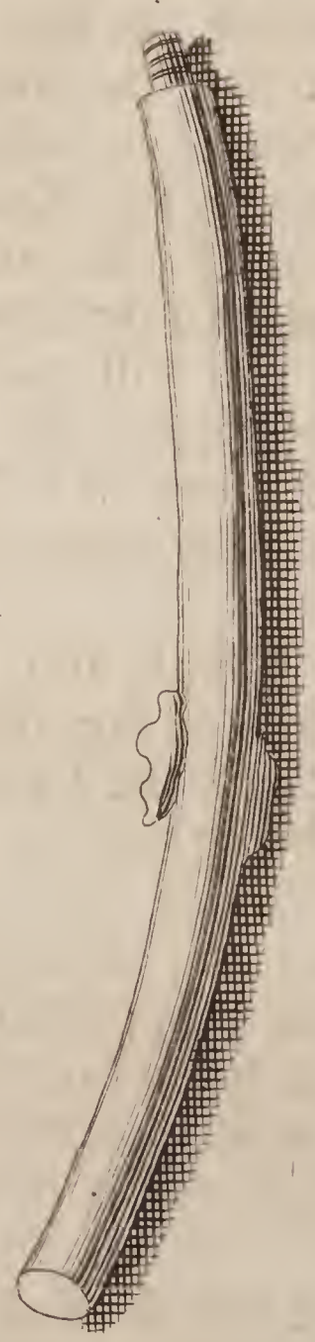


Fig. 95.

Toms sculp.

Next Evening I took off the Pultice and Dreſſing, and cut the Stitch; then fomented the Wound and all the Abdomen with Stupes wrung out of *Aq. Calc.* and freſh Urine, as warm as he could bear it; then dreſſed the Wound as before. Then I rubbed the *Scrotum*, *Penis*, and Groins, with *Unguentum Album*, to prevent their being ſcalded by the Urine, which flows from the Wound.

The Wound muſt be dreſſed twice a Day at leaſt, till you have a plentiful Digeſtion.

After every Dreſſing, the Ointment and Oil was uſed, as before directed.

There is little Variation in the dreſſing of the Wound, except what is common in others.

The Urine flows always thro' the Wound, until the Wound of the Bladder is cured; which is ſooner or later according to the Conſtitution of the Patient.

When the Urine begins to come the right way, it pains and ſcalds them much after the ſame manner, as when they had the Stone (which is cauſed by the Contraction of the *Urethra*, that has been ſo long uſeleſs) but it never laſts above a Day or two, and then they may make Water with the ſame Eaſe and Freedom as any other Perſon.

They ought not to be forced to go to Stool under ſix or ſeven Days, unleſs there is ſome particular Reaſon for it, becauſe ſtraining to go to Stool injures the Wound.

They ought never to be taken up, except to get their Beds made, until the Urine comes all the right way, becauſe it makes them ſick and faint; and conſequently hinders the Cure of the Wound.

Cold is to be avoided as the Peſt, becauſe it puts them to a great deal of Pain either to ſtifle it, or to cough out.

N. B. If a flexible *Catheter* could be paſſed, and kept in the Paſſage without Pain, it would very much haſten the Cure of the Wound.

I made this Operation the firſt time on the 23d of *December* 1719, upon a Boy between ſixteen and ſeventeen Years of Age, and in five Weeks time he was perfectly cured.

The Stone was of the Figure and Bigneſs of *Fig.* 97. *Fig.* 97.

I made the ſecond Operation on the 12th of *May* 1720, on a Boy of eight Years of Age, and in ſix Weeks time he was perfectly cured.

The Stone was of the Figure and Bigneſs of *Fig.* 98. *Fig.* 98.

The third Patient was but three Years of Age, and was cut in *Auguſt* 1720; but died of Convulſions about fifteen Hours after the Operation.

Fig. 99. Shews the Form and Bigneſs of this Stone. *Fig.* 99.

The fourth Operation was made on the 23d of *March* 1720-21, upon a Boy fourteen Years of Age; and in four Weeks afterwards he was perfectly cured.

This

Fig. 100. This Stone is represented in *Fig.* 100.

In this Patient I made a small Wound in the *Peritonæum*, through which I saw the Guts present, but I pushed them back with my Finger, and then stitched the Skin; and we had no farther Inconveniency by it. These three Patients have been already shewed before the Society.

This Operation may be performed with equal Success on Females, when the Stone is large; but if it is but small, the common way of extracting them is very good.

From all which I think I may safely conclude in the Words of the inimitable *Rossetus*.

Post hæc nemini dubium esse debet, novam hanc nostram Cystotomiam, vetere illâ tot doctissimorum Chirurgorum Cystotomiâ (tam periculosâ, ut eam aggredi vel ipse Hippocrates Chirurgôn Chirurgotatos metuerit) & leniorem & tutiorem haberi.

Observations upon dissecting the Body of a Person troubled with the Stone; by Dr Perrot Williams. N° 377. *p.* 326.

XVII. 1. Mr *William Bowen* of *Haverford-West*, aged between 40 and 50, having been, for about seven Years, severely afflicted with the usual Symptoms of the Stone in the Kidneys and Bladder, *viz.* bloody Urine after Exercise, Strangury, *&c.* died in *May* 1722. His Body being opened, there were found in the Bladder six smooth oval Stones, exactly of the same Figure, and nearly of the same Magnitude: There were also three Cells in each Kidney, the Figure of each suitable to that of the Stones: The *Ureters* were so preternaturally extended, as very easily to admit the largest of the Stones to pass from the Kidney to the Bladder. The *Viscera*, *&c.* appeared in their natural State.

---By P. Hardiway, *M. D. F. R. S.* No. 377. *p.* 327.

2. Homo septuaginta circiter annos natus, ventris dolore horrendo correptus est die Oct. 19, 1722. Accesserunt Vomitus & Urinæ difficultas, præ doloris atrociâ sese erigere non poterat, sed misere incurvatus, dies noctesque prope focum jacebat ejulans. Sexto morbi die, urinâ prorsus suppressâ, de dolorosâ circa Hypochondria strictură, perinde ac a funibus circumjectis, querebatur, postea de pondere quodam in vesicâ molesto, quasi Rapi majoris, (sic aiebat) inibi hospitantis. Omnibus in pejus ruentibus, die morbi duodecimo ad plures abiit. Cadavere aperto vesicam secuimus, quam ab ullis vel minimis calculi vestigiis immunem invenimus; in utroque autem rene (multâ aquâ refertis) repertus est calculus, insignis, scaber & multiplici ramo per parenchyma se dispergens, quem integrum extrahere nullâ arte potuisses, nisi totâ prius frustulatim decerptâ carne. Ramorum maximus in ureteris caput se insinuans, perbelle adeo id occupaverat, ut ampulla obturamento suo arctius occludi vix posset. Ulterius scrutari nobis non licuit, ideo unum tantum addam, nempe, quod Omentum instar fasciæ angustioris sub hepate retractum delitescebat. Pauper erat & corpore athletico, semper sanus, nisi quod a paucis annis, aliquando sabulosa per urinas excerneret.

Fig. 101, 102.

3. Juvenis

3. Juvenis ſtudioſus per duos annos Dyſuria frequenti laborans, per illud tempus ultra quinquaginta calculos excrevit, quorum plerique ſine inſigni dolore inter mingendum feceſſerunt; quidam tamen eorum reliquis majores, piſorum majorum vel phaſeolorum magnitudinum habentes, in urethra ſubſtiterunt, ac manu chirurgi comminuti aut ſectione extracti fuerunt. Incidit hic ſenſim in Maraſmum totius corporis, ac urgente tuſſi ſicca & Aſthmate, accedente inſuper tumore pedum œdematoſo, tandem pridie ante mortem, lecto affixus, animam Creatori reddidit. Ad ſectionem corporis defuncti accedentes, aperto Thorace pulmonem cum pericardio, diaphragmate & coſtis, hinc inde concretum, ac in dextro præprimis latere ſcirrhoſum invenimus, in utroque præterea ventriculo cordis, Polypos inſignes, qui truncos vaſorum occupaverant, & proculdubiò Aſthmatis atque inſequentis ſuffocationis, mortiſque ſubitaneæ præcipua cauſa fuerunt.

By Abraham Vater, *M. D. F. R. S.* No. 394. *p.* 102.

In abdomine hepar & lien nullo manifeſto vitio laboravant; inteſtinum autem ileon ſugillatum erat & colon in toto ſuo ambitu, à dextro inde latere, ubi hepati accumbit, una cum recto, ita conſtrictum & contractum apparebat, ut vix digiti craſſitiem æquaret, nullamque ferè cavitatem interiùs monſtraret.

Tandem vias urinarias, utpote officinam tot calculorum viſitantes, in renibus atque ureteribus nihil præternaturalis invenimus, in veſica verò tres calculos, phaſeolorum magnitudinem habentes, eos tamen non liberos, ſed membrana valida involutos, ac lateri anteriori prope ſphincterem adhærentes deprehendimus, quos in rei memoriam una cum eorum involucro aſſervo. Unde hæc membrana, calculos involvens originem trahat, explicatu difficillimum mihi videtur; quamobrem hac data occaſione, flatu per ureterem utrumque immiſſo, inquiſivi, an illa (*viz.* membrana) cum ureteribus communicet; & utrum ſit ipſa membrana Veſicæ interior, à calculis in ureteribus, inter ſubſtantiam Veſicæ incedentibus, una cum uretere, vel hoc rupto, extenſa: nihil tamen detegere potui. Hos tamen calculos Dyſuriæ non tantùm continuæ, ſed etiam propter irritationem perpetuam, conſtrictionis præternaturalis inteſtini coli atque recti extitiſſe, rationi conveniens videtur.

4. A Man aged 70 Years, died of a Suppreſſion of Urine, occaſioned by a Stone ſtopping in the *Urethra*, juſt within the *Glans*, of the Bigneſs of a Horſe-Bean. This Appearance, with the Symptoms that had attended this miſerable Man, gave me Reaſon to expect ſomething remarkable in the urinary Paſſages. The *Ureters* and *Pelvis* were very much diſtended; which is common where great Numbers of Stones have deſcended down them, from the Kidneys to the Bladder. The Bladder contained about *ſixty Stones*, the largeſt of which was about the Size of a Walnut, the others ſmaller; and juſt within the Neck, was a *hard Tumour*, as big as a Nutmeg, which almoſt cloſed the Orifice; and indeed the Situation of this

By Mr John Ranby, *F. R. S.* No. 401. *p.* 413.

Tumour was ſuch, that it not only made the paſſing the *Catheter* very difficult, and hindered our feeling the Stones, by directing the Inſtrument upwards; but likewiſe would alone produce the Symptoms of the Stone in the Bladder, by obſtructing the free Diſcharge of Urine through the *Urethra*; the inner Membrane of which appeared as if lacerated in ſeveral Places, and the Tube filled with a glutinous Matter tinged with Blood. On the back Part of the *Veſiculæ Seminales*, near the *Proſtata*, were ſeveral *Stones*, as large as Peas, which cloſely adhered to the adjacent Membranes.

--- *By Mr* John Dobyns, *F. R. S.* No. 402. *p.* 452.

5. Mr *Laurence*, a Gentleman of about forty Years of Age, had for near twenty Years a Complaint in his Kidneys; making bloody Urine upon any extraordinary Motion, but free from the great Pain, and all other Symptoms uſually attending nephritic Caſes. However, upon opening the Kidneys after his Death, there was in each a Stone of an extraordinary Size and Figure, beſides 100 ſmaller, which are brought for the View of the Society, with a Deſcription and Draught of the two largeſt ſubjoined.

Fig. 103. *Fig.* 103. Shews the Stone denudated, as taken from the *Pelvis* of the right Kidney. *a.* That Part which had branched into the *Ureter*, and totally obſtructed it's Channel. *b. b. b.* The eminent Parts of it. *c. c. c.* That Part which filled the Capacity of the *Pelvis*.

Fig. 104. *Fig.* 104. Shews the Stone taken from the left Kidney. *a.* That Part which had protruded itſelf into the upper Part of the *Ureter*, but did not totally plug it up, by which Means the Urine had a Paſſage. *b. b. b. b.* The eminent Parts which branched into the *Fiſtulæ membranaceæ*. *c. c. c. c.* The Body of the Stone which lay in the *Pelvis* of this Kidney.

Great quantities of Stones, voided during the uſe of the Pyrmont *Waters. By* Abraham Vater, *M. D. F. R. S.* No. 377. *p.* 322.

XVIII. Nobilis Pomeranus, ſanus ac vegetus, uti ipſe de ſe refert, nulliuſque mali ſibi conſcius, ante hos tres annos, ſuaſu amici, converſationis cauſa, ſocium ſe ipſi adjuxit, in bibendis aquis medicatis *Pyrmontanis*. Factum autem eſt, ut, cum potando aliquot dies tranſegiſſet, calculos quoſdam minores, abſque ullo quidem dolore, excludi inter mingendum ſentiret. Effectum hunc criticum eſſe ſibi perſuadens noſter, aquas iſtas aucta doſi bibere incipit, quo facto, quatuor vel quinque dierum ſpatio, ultra quadraginta calculi, rurſus tamen ſine moleſtia, exierunt. Hoc viſo, ſtrenuè & alacriter potare pergit, optimum hujus curae effectum ſibi promittens. Aſſumpta vero ita nimia aquae quantitate, urina ſupprimitur, adeo, ut ne minimam ejus portionem per tres dies emittere potuerit, uſque dum catheteris ope via aperiretur. Commonefactus itaque à Medicis, ab uſu aquarum ulteriori abſtinuit, rem ita peractam eſſe credens. Non ita multo poſt, vir iſte iter faciens, continuo mingendi conatu laceſſitur, ac iterum iterumque ex rheda deſcendere cogitur, tandemque inter graviſſimos dolores ſanguinem purum effundit. Duravit mictus cruentus & doloroſus, quamdiu aeger in itinere conſtitutus fuit, poſtquam vero hic, domum reverſus, quieti ſtuduit, ſtatim ceſſavit, nec

quicquam doloris remanſit. Quoties vero ab illo tempore ſive rheda, ſive equo veheretur noſter, rediit dolor, & ſanguis cum urina ſeceſſit, ſed quiete reſtituta, iterum evanuit, nullo planè dolore ſuperſtitè. Contigit quidem interdum, ut calculus unus vel alter prodiret, rarius tamen hoc factum eſt, nec ullum ex eo dolorem percepit aeger, quoniam hi longè minores, quam quos inter aquarum uſum reddidit, fuerunt. Symptomate hoc admodum moleſto per duos integros annos vexatur aeger, tandem uſu medicamentorum liberatus eſt. Ceſſante itaque penitus mictu cruento, nil magis timuit, ſed integrae ſanitati reſtitutus ſibi viſus, medicamentis valedixit. At, quid fit? Augetur poſt illud tempus indies Stranguria, virque continuo die nocteque ad urinam reddendam ſtimulatur, quo malo ipſe ad hunc uſque diem affligitur. Urina, quae parciſſima quantitate, ſummoque cum dolore emittitur, craſſa exit, ob pituitam viſcidam admiſtam, quae fundum ſtatim petit, glutini ex farina confecto ſimilis, tantae tenacitatis, ut in fila quaſi trahi queat. Aeger interea appetitu bono gaudet, & ſomno quoque ſufficienti utitur, nec ullibi praeterea in corpore dolorem ſentit.

The Caſe conſidered.

Si quis hiſtoriam morbi, quoad omnes ejus conditiones, accuratè perpendat, mecum confitebitur, eandem vix parem inter obſervationes Medicas agnoſcere. Notatu digniſſimum imprimis eſt, potu aquarum iſtarum mineralium, calculos ſat inſignes, in tanta copia, atque intra tam breve temporis ſpatium excluſos eſſe, a viro, uti ipſe de ſe refert, ante aquarum uſum perfectè ſano, nec ullum calculi indicium unquam ſentiente. Non levem hoc in animo excitare poteſt ſuſpicionem, calculos non tam ab aquis propulſos, quam ex croco minerali, qualem aquae tales medicatae in ſinu gerunt, generatos potius in hoc aegro fuiſſe. Parum quidem huic ſententiae favere videtur tempus admodum breve tot calculorum concretioni vix idoneum, quoniam hi, paucos poſt dies ab inchoato aquarum potu, excluſi ſunt. Non tamen exiſtimo, quenquam facilè definire poſſe, quantum temporis ſpatium ad calculi in corpore generationem requiratur; poterit hoc forte eſſe exiguum. Longè enim minus veritati conſentaneum videtur, calculos iſtos jam tum in viis urinariis latitaſſe, quoniam vir ille nunquam antehac urinae difficultatem, aut aliud calculi ſignum percepit. Confirmant è contrario omnes hujus caſus circumſtantiae, *concretionem iſtam ſubito factam eſſe.* Calculi enim ipſi nullatenus aſperi atque anguloſi, quales alias veſicae calculi eſſe ſolent, ob ſucceſſivam ſpiculorum ſalinorum cohaeſionem, ſed piſorum majorum minorumque inſtar, rotundi, glabri, & politi obſervantur, quod coagulationem eorum ſubitaneam docere videtur. Color eorum luteus convenit exactè cum ſedimento illo, coctione ex aquis *Pyrmontanis* extracto, cujus minimam portionem ex quatuor unciis aquae hujus paratam addere volui, ut tanto melius convenientia iſta pateſcat. Fracti calculi ſtrata ejuſmodi variegata interius monſtrant, qualia in tophis thermarum Carolinarum deprehenduntur, quorum pariter par-

ticulam exiguam adjeci. Addidi propterea quoque calculos duos, cum aliquot fruſtulis contritorum, pauciſſimos enim tantum obtinui. Ultimo tandem loco attendi quoque meretur ſingularis iſta circumſtantia, quod maxima horum calculorum pars inter ipſum aquarum uſum excluſa ſit, poſt illud tempus vero rariſſimè tales, iique longe minores prodierint. Non tamen ideo culpa hujus rei in aquas iſtas medicatas conjicienda erit, quaſi hae ad calculi generationem diſponant, cum potius debilitati viſcerum, ac pravae digeſtioni adſcribi debeat effectus ille extraordinarius.

A large Stone voided through the Urinary Paſſage, by a Woman. By Dr Rich. Beard, *F. R. S.* No. 397. *p.* 211.

XIX. A poor Woman in the Pariſh of *Fladbury* in *Worceſterſhire*, aged 63, about * three Years ago, was afflicted with the uſual Symptoms of a Stone in the Kidneys, and afterwards in the Bladder. The Fits of Pain occaſioned by it increaſed as it's Bulk did; till ſhe was ſo emaciated by them, that her Caſe was judged deſperate. Finding Relief (towards the End of laſt Summer) by a plentiful Uſe of Mallow-Tea, ſhe perſiſted in it for a while; when on a ſudden, in the Preſence of ſome Women, ſhe perceived an uncommon Weight and Force within, which aſſiſting with all the Strength and Breath ſhe had left, a Stone came away with a Noiſe that very much ſurprized the whole Company, and with leſs Pain and Effuſion of Blood then, or Soreneſs afterwards, than might have been expected. She is ſince eaſy and in health, and feels no other Inconvenience now, but that unavoidable one, an *Incontinentia Urinæ*.

Fig. 105. The Stone (of which I ſend you the Side-view, drawn as near to the Life as we could) is of the ſame Colour and Texture with others of this kind that I have ſeen, formed in human Bodies. It's Weight, as I at preſent find it, is ℥ij. ℥j. 55. *gr. Avoird.* When firſt voided, 'twas conſiderably more, ſeveral Pieces having been rubbed off at *c c*, and likewiſe on the other Side: The greateſt Circumference is 7 Inches and $\frac{1}{2}$; 'tis 4 Inches $\frac{3}{4}$ round at the thickeſt Place, and the Length on the Convexity is 4 Inches $\frac{7}{8}$; the Parts of the Stone at *a a a* are ſomewhat jagged and ſtained with Blood, as is the little Protuberance on the oppoſite Side *b*. Here, I ſuppoſe, it met with the moſt Reſiſtance, at the Time of it's Expulſion thro' the Urinary Paſſage.

A Stone broken in the Bladder, and diſcharged thro' the Urethra; *by* Laurence Heiſter, *M. D. F. R. S.* No. 417. *p.* 13.

XX. In terris Brunſvicenſibus in Coenobio ſeculari, quod *Marienthal* appellatur, & ad horae circiter diſtantiam ab Helmſtadio, celebri Academiae Juliae ſede, ſitum eſt, rerum oeconomicarum hujus Coenobii Praefectus, nomine Widmannus, vir ſexagenario major, ſed robuſtus & duro vitae victuſque generi adſuetus, qui per plures annos primo calculo renum ſaepe & vehementer laboravit, eorumque ſenſim magnam copiam, quorum multi Piſi magnitudinem ſuperarunt, per iter urinae haud ſine magnis doloribus excrevit. Tandem vero quatuor ab hinc annis calculi quoque veſicae om-

* *This Paper is dated* June 29, 172$\frac{5}{7}$.

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Fig. 97

Fig. 98

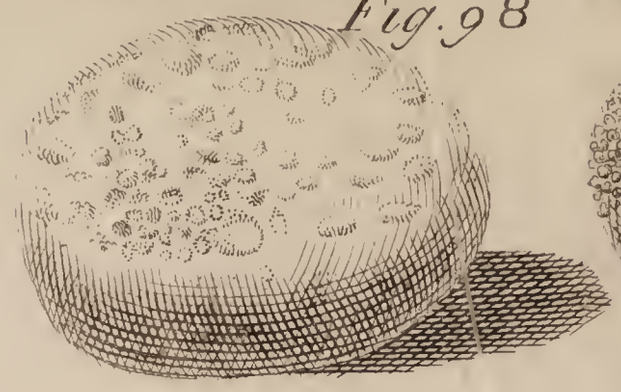
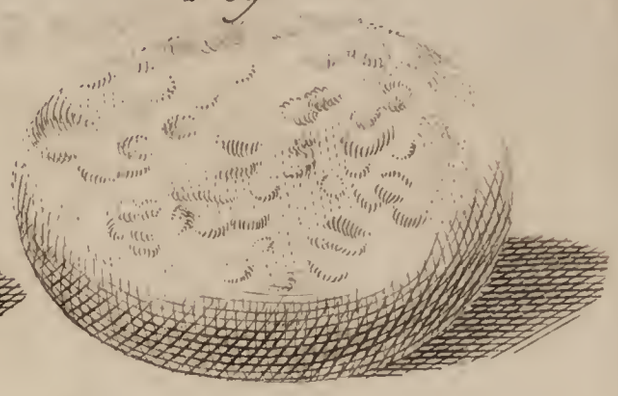


Fig. 99

Fig. 100



Calculus Renis sinistri

Fig. 101

A. Pars calculi superior
B. Apex calculi costas versus
C. Ramus
D. Ramus alter ureteris caput obstruens

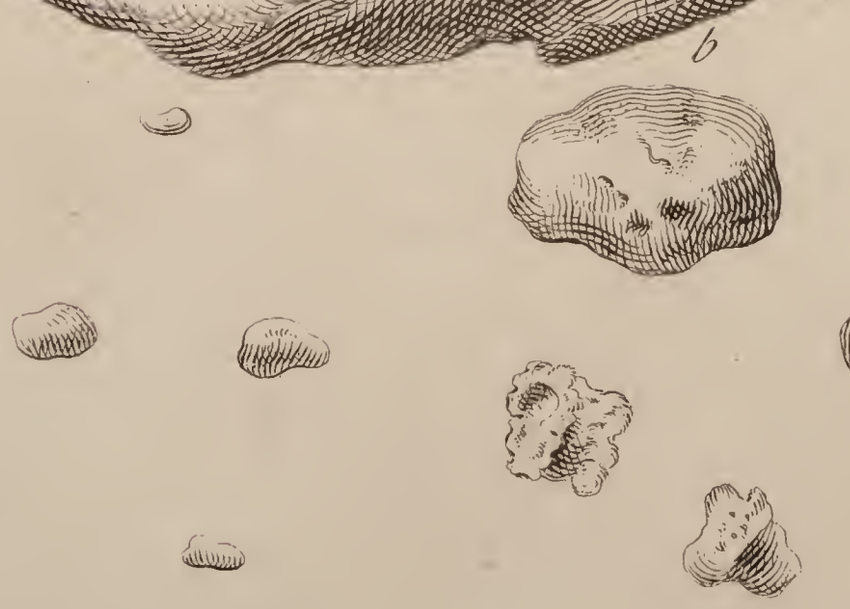
Calculus Renis dextri

a. Apex calculi costas respiciens
b. Pars calculi superior
c. Protuberantia
d. Ramus coxam versus se extendens
e. Cavitas ubi osiculus protuberantiam sive processum faciens abruptus
fff. Pars calculi inferior Ureteris caput occupans

Fig. 102

Fig. 103

Fig. 104



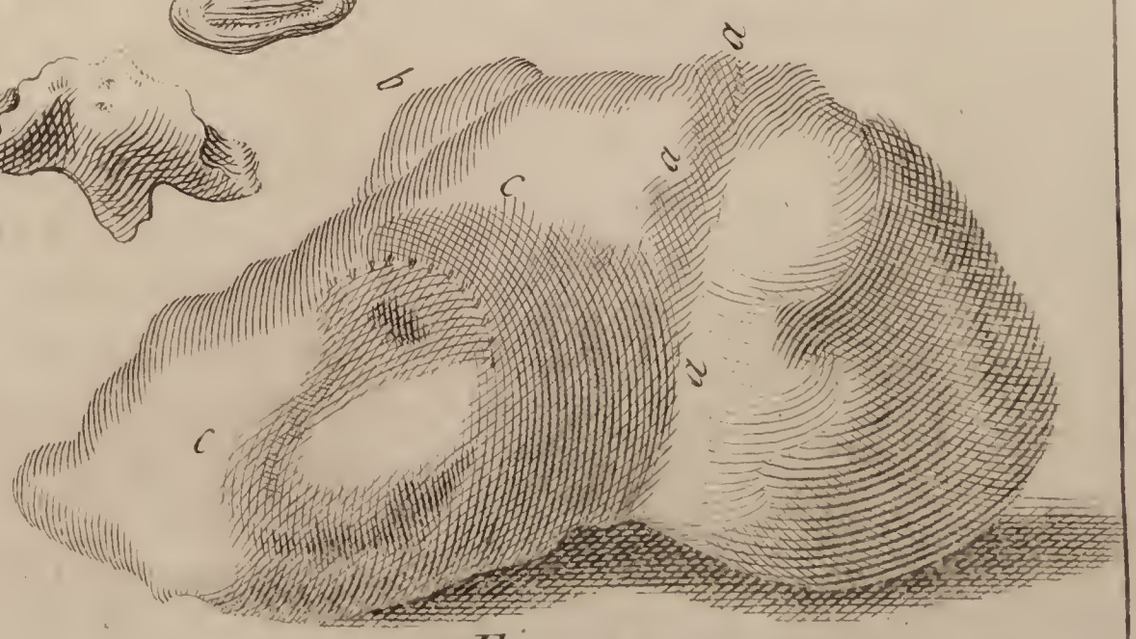


Fig. 105

Toms sculp.

nia percepit ſymptomata, ita, ut ſaepe non niſi maximis cruciatibus in pubis & perinaei regione perceptis urinam excernere voluerit. Tandem vero Anno 1728, poſtquam aliquamdiu variis, uſus erat remediis, & inprimis Tinctura antinephritica, ut vocant Lipſienſi ſive Rothiana, atque ſimul cereviſiam illam his in regionibus contra calculum celeberrimam, quae Regiae Luterae vulgo **Koenigs-Lutter,** oppido Brunſvicenſi, coquitur, & quam **Duchſtein** appellant, hancque ob cauſam in loca ſive urbes remotiſſimas devehitur, continuo pro potu ordinario hauſerat, aliquando vehementes inter mingendum dolores, niſum & conſtrictionem in veſica, ſenſumque eo ipſo, ac ſi calculus, ſive calculi in veſica frangerentur ac diſſilirent, percepit, eoque ipſo mox aliquot fruſtula calculi fracti cum lotio dejecit, quae deinde per plures dies alia ſecuta ſunt, donec tandem ab eis liberatus bene atque pancratice ab omnibus & calculis & calculi doloribus, immunis nunc vivat. Calculos plures una in hoc viro fuiſſe majores, quam ut integri per urethram tranſire potuiſſent, docent primo diverſus color diverſorum fruſtulorum, quorum non nulla fuſcum obtinent colorem, alia flaveſcentem ad ſulphuris colorem aliquo modo accedentem, quemadmodum ex his adjectis fruſtulis perſpicere eſt. Deinde id evincunt diverſa horum fruſtulorum ſegmenta: quorum alia majoris alia minoris arcus ſegmenta ſunt. Quod ad numerum attinet fruſtorum, centum circiter ejuſmodi mihi dedit, qualia nunc offero, quae ex matula collegit. Sancte vero mihi affirmavit, magnam eorum, imo forte adhuc majorem copiam in terram decidiſſe & periiſſe, cum ſaepe ruri, vel in ſylvis, vel in ſtabulis ad res domeſticas curandas degens, mejendi ſtimulo fuerit correptus, atque ſic multa cum urina vel in terram, vel inter herbas aut ſtramina ejecerit. Nonnulla horum fruſtulorum dimidium pollicem aequant, plura minora ſunt, eorumque ſuperficies externa convexa, interna in pleriſque concava, alia nucleum, ut vocant, calculi adhuc exhibent.

Ipſe vir eſt honeſtus, antiquae & germanae fidei, cui, ut hac in re fallat aut mentiatur, nulla eſt cauſa. Notus eſt morbus olim perpeſſus hominibus quamplurimis; nota jam eſt ejus ſecunda valetudo omnibus, qui eum norunt. Calculorum fractorum ingens copia & facies, quod revera è veſica ſint, rem ulterius confirmat, ita, ut certi eſſe poſſimus, haec fruſta revera in veſica ejus integros calculos fuiſſe, qui poſtea in veſica, neſcio utrum medicamentorum, an cereviſiae illius, an naturae beneficio diſrupti & expulſi ſint. Ex ſegmentis fruſtulorum valde convexis, quae hic mitto, & quae adhuc adſervo, judicare licet, vix ullum illorum calculorum nucem moſchatam ſuperaſſe plures vero minores fuiſſe. Interea tamen ſolutionem calculorum in veſica haud prorſus impoſſibilem eſſe, mihi evincere videntur, licet res forte quam rariſſime contingat.

A large Stone in the Urethra; *by Dr* J. Huxham. No. 413. *p.* 257.

XXI. Viginti abhinc Annis Penis cujuſdam *Cookworthy* ob Luem Veneream, ad modum quaſi *Eunuchi Turcici*, reſectus fuit: at Vulnus nec probe curavit Chirurgus, nec bene ſanavit; Cicatrice quippe obducta vix ullum Urinae Iter, Urethra pene occluſa. Lotium exinde exiguiſſimo Rivulo ſummoque niſu reddidit; brevique inter mingendum Cruciatus magnus acceſſit; pauloque poſt in media, at ſuprema, Parte Scroti Tumor parvus, ſenſim tamen auctus in magnam demum excrevit molem, laevum ad Inguen quaſi vergens. Hinc Urinam ejaculandi impotens prorſus factus Stillicidio ejus continuo laboravit. Sed neque hàc via, Urethrae ſcilicet, omnem emulxit; enatis enim tribus quatuorve in Scroto Fiſtulis, pars forte maxima Lotii ex hiſce defluxit, Pure ſubinde comitante. At ne ſic quidem Tumor, jam durus admodum, vel minime decreſcebat, quinimo increvit uſque.

Dira haec inter Tormenta cum per plures jam Annos Miſer hic, neglectus omnino, miſerrimam pertraxerat Vitam ad noſtrum Noſocomium tandem delatus fuit. Ibi menſe Julio elapſo, quum ſummo nixu Urinam, ſolito quod dixit ardentiorem, expellere, Corpus incurvando maxime, contenderet, ingens hic prolapſus eſt Calculus; qui recens excretus ℥v. ſß Ponderis Avoird. pependit. Eum mihi propere, quaſi monſtrum quoddam, mitti curabant Noſocomii Rectores. Rem certe quod debui plane mirabar Hominemque inviſebam continuo. Lacerum inveni Scrotum, jam minime tumidum, Manum puerilem facile admittens, & ex Urethra Calculum elapſum fuiſſe deprehendi.

Atqui id forſan haud parum Miraculo adjiciat, quod magnum hoc lacerumque Vulnus Balſamo quodam Terebinthino tantum oblinendo brevi ſanum evaſit, ni quod parva adhuc pateat Urinae Fiſtula in ſuperiore Parte Scroti. Atque Miſellus Ille, cui ante excretionem Calculi vix ulla ſe movendi Potentia, commode jam ſatis obambulat.

Non ego quidem hunc Calculum in Urethra primitus fuiſſe enatum autumo, ab ibidem Loci ex arenoſa materia concretum maxime. Cum enim parvus forte Calculus, Semen quaſi hujus enormis, è Renibus delapſus erat; & ob Urethram fere occluſam, negato ultra Itinere, in Canaliculo ſubſtiterat, Sabulo perpetim appellente auctus in immenſam hanc Molem tandem excrevit.

Two Chirurgical Queſtions, ſtated and anſwered by John Douglas, *Surgeon, F. R. S.* No. 399. *p.* 318.

XXII. Q. 1. Whether it is not poſſible in ſome Meaſure to relieve thoſe Perſons (who by reaſon of their great Age, bad Habit of Body, *&c.* cannot ſubmit to any of the great Operations for the Stone with tolerable Hopes of Succeſs) by making an artificial *Fiſtula* in the *Perinæum*?

A. That a great many Patients offer, both young and old, who are afflicted with the Stone in the Bladder, whom we cannot with any tolerable hopes of Succeſs, adviſe to ſubmit to the great Operations for the Stone, daily Experience ſhews. It is inhuman to cut them,

and

and ſhews very great Imperfection in our Art, to ſay we can give them no Relief. Is there no *Medium* yet found out between living in extreme Miſery and ſubmitting to a deſperate Operation? Yes; *Thomas Fienus*, about 125 Years ago, propoſed a Palliative Cure for ſuch Patients, where a radicative Cure could not be expected; an Operation which may be performed with Safety on the moſt Ancient; the Wound is ſo ſmall, and the Parts cut of ſo little Conſequence to Life. An Operation by which we can prevent or alleviate the moſt lamentable Effects of the Stone, *viz.* The total Suppreſſion of Urine and the cutting Pains they endure in, and after, making Water, *&c.* yet this Operation has been as little minded all this while by the *Hoſpital-Lithotomiſts*, as *Roſſet*'s moſt excellent Treatiſe before I introduced the Hypogaſtric Section in 1719. Tho' I admire *Fienus*'s Deſign in making this *Fiſtula*, yet I can by no means approve of his Way of doing it.

It ought to be performed thus: Place the Patient as in *Marianus*'s Operation; paſs a Staff into the Bladder, then cut the Skin and Fat until you lay that Part of the *Urethra* bare, which reaches from the *proſtate Gland* to the cavernous *Urethra*; then make a ſmall Inciſion into it with the Point of your Knife; then withdraw the Staff, and paſs a ſmall flexible *Canula* into the Wound of the *Urethra*; then dreſs the Wound S. A. extract the *Canula*, clean it, and introduce it again every Dreſſing, that ſo you may leave a *Fiſtula* in the room of the Wound.

Through this *Fiſtula* the Patient himſelf or any one about him, may eaſily paſs an oiled Probe, and puſh the Stone back whenever he finds himſelf attacked with a Suppreſſion of Urine, or when the Stone preſſes hard againſt the *Sphincter*, when endeavouring to make Water, which otherwiſe could not be done without the Ceremony of ſending for, or ſtaying in Miſery 'till a Surgeon comes to paſs the *Catheter*, which in ſuch Caſes is not always to be done, without a great deal of Pain, and ſometimes Danger. By this *Fiſtula* we can alſo very eaſily inject any Liquor that may be thought proper either to prevent or allay the Inflammation of the Bladder, or cleanſe it from the Gravel, or any other ſort of Filth that may collect there, by which the Increaſe of the Stone will be prevented, *&c.*

In Females all thoſe Advantages are obtained by the natural Straitneſs and Shortneſs of the *Urethra*, whence they never ſuffer the tenth part that Males do; which is an inconteſtable Evidence, that when the Paſſage into the Bladders of Males is made as ſtraight and near as ſhort (as is done by the forementioned *Fiſtula*) they will reap the ſame Advantages by it.

Therefore artificial *Fiſtula's* in the *Perinæum* ought to be made for thoſe who by reaſon of their great Age and bad Habit of Body, *&c.* cannot undergo any of the great Operations for the Stone, with any Hopes of Succeſs.

Q. 2. Whether

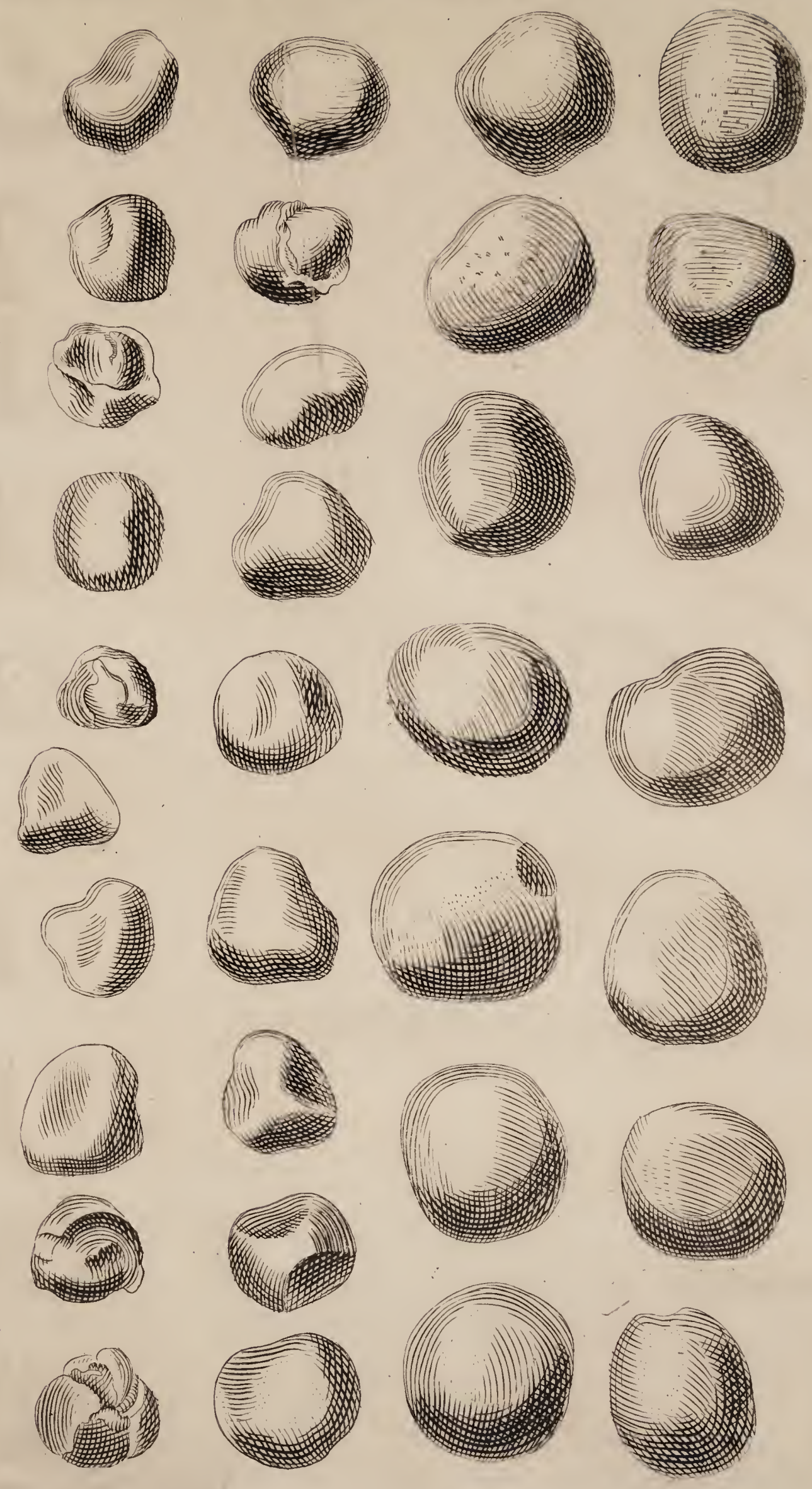
Q. 2. Whether it is not poſſible to dilate the artificial *Fiſtula* in the *Perinæum* of Males, and the *Urethra* of Females, with Spunge or Gentian-Tents gradually increaſed for ſome time, to ſuch a width, that we may eaſily paſs a Pair of Forceps into the Bladder, with which the Stone, when ſmall, may be extracted; and when large, or of an irregular Figure, broken, and the Pieces extracted gradually and at different times, when they cannot be extracted at once, without fatiguing the Patient too much.

A. To prove that both theſe *Fiſtula*'s may be dilated to a ſufficient Bigneſs by the Means propoſed, (eſpecially, if the Parts are frequently bathed in a *Semicupium* or otherwiſe, as the Operator ſhall think proper, and ſome warm Oil injected into the *Fiſtula* every time the Tent is changed, (the better to ſupple and relax the Parts) I ſhall only make uſe of three Arguments, *viz.* One from common Experience in Analogous Caſes; another from the Operations of Nature on the ſame Parts; and the third from Inſtances of this Operation being performed after the Method I propoſed. 1ſt, Common Experience ſhews to what a great Width *Fiſtula's* in all other Parts of the Body, tho' very ſmall at firſt, may be dilated by Spunge or Gentian-Tents. 2dly, Nature herſelf, without any Art, has frequently performed this Operation on both Sexes; in Males who have been cut for the Stone, the old Way, and had *Fiſtula's* remained in *Perinæo.* It is often found, that ſome conſiderable time afterwards, Stones of no ſmall Size have appeared, which had made their way thro' the Sphincter of the Bladder into the Membranous *Urethra*, and ſtuck near the Orifice of the *Fiſtula*, whence they were eaſily and ſafely extracted. I ſaw a Stone lately as big as a Pullet's Egg that was expelled from the Bladder of a young Woman without any Help, as her Phyſician aſſured me, and ſhe had no Inconveniency afterwards, which certainly would have happened if it had been extracted after the common violent Method. Dr *Beard* gives an Account of a yet larger Stone, that paſſed after the ſame manner, but ſhe had the common Inconveniency afterwards, *viz.* an Incontinency of Urine, which was owing more to the Roughneſs than the Bigneſs of the Stone, which had lacerated the Parts as in the common Operation; which might have been prevented, had ſhe been aſſiſted in time, as above.

3dly, M. *Collet*, in his *Traité de la Taille*, gives an Account of a Gentleman on whom he performed this Operation three different Times, and extracted in all ten Stones. His Words are as follow:

Enfin, Monſieur Uſſon *etant hors de danger & ſa playe prête a ſe cicatriſer, prévoyant bien ce qui pourroit arriver dans la Suite, je lui conſeillai de tenir ſa playe ouverte, pour y entretenir ſeulement une petite Canule, qui dans l'occaſion donneroit une entiere liberté de fair Injection pour nettoyer la Veſſie de toutes les Immondices & pour qu'on pût enlever les nouvelles*

Pierres



33 Stones cut by the lateral operation out of a person of 63 years of age, who perfectly recovered by Mr. Chesselden N.o 404. Plate 2.

Pierres qui pourroient ſe former. Il prit ce parti, & il ſe trouva bien durant cinque Années, quil a Vecu depuis avec aſſez de Santé Mais a trois differentes repriſes, je mi ſuis vû obligé de lui tirer juſqu'a dix autres pierres qui s'etoient formées dans la Veſſie : une petite Tente d'eponge preparée miſe pendant quelques heures dans la Fiſtule à la place de la Canule me facilitoit l'Entrée d'une tres petite tennette. Monſ. Uſſon *s'habilloit dans ce Moment & il ſortoit pour aller par tout ou ſes Affaires l'appelloient.*

I know a Gentleman that now keeps a *Fiſtula in Perinæo* open for the very ſame Reaſons.

Since then it is evident, that *Fiſtula's* in all Parts of the Body are dilatable to a great Width, ſince Nature is often able of herſelf to dilate the very Parts in diſpute, to a very extraordinary Degree; and ſince this very Operation I here propoſe has been ſucceſsfully performed three times on the ſame Perſon,

Therefore *Artificial Fiſtula's* in Males and the *Urethra* in Females may be dilated ſo as to extract any Stone without cutting the Body of the Bladder, or lacerating any of the Parts.

N. B. This Operation will appear leſs ſurprizing, if we conſider, that it is only dilating the Sphincter of the Bladder, *&c.* in a different manner from that daily done in *Marianus*'s Operation, *i. e.* By this Method the Parts are dilated gently and gradually, after being well bathed and anointed, the better to relax them. Whereas in *Marianus*'s Operation they are dilated quickly and violently, and then the Stone, be it of what Largeneſs or Figure ſoever, is forcibly drawn out immediately; whence Contuſions, Lacerations, Hæmorrhages, Inflammations, Mortifications, *&c.*

A Flux of Blood thro' the Penis; *By Dr* Howman. No. 379. *p.* 418.

XXIII. Quadragenarius quidem civis *Norvicenſis* pancratice valens, profluvio ſanguinis ſinceri per canalem Urethrae correptus eſt, 30 die Junii, 1716. Idem rediit phaenomenon, 31 Julii. Adhibitis quibuſdam medicamentis, & celebrata venaeſectione in Brachio, cohibitus eſt fluxus ſanguinis praedictus, uſque ad octavum diem Septembris, ac deinceps penitus evanuit. Notatu tamen eſt dignum haemorragias ſupra memoratas abſque omni praevio dolore, ſeu poſtea ſpirituum dejectione contigiſſe.

Two Caſes of Inſects voided by the urinary Paſſage; by Dr Daniel Turner. No. 391. *p.* 410.

XXIV. *Novemb.* 24, 1725, a poor Woman came to crave my Advice for an Infant of about 16 Months old, bringing with her a Worm, which ſhe told me the Apothecary had juſt then drawn out of the Child's *Penis*, who had for ſeveral Days before laboured under great Uneaſineſs; which ſhe called Convulſions of the Bowels. It was continually drawing up the lower Limbs, and ſtraining at both Sphincters; the Urine ſeemed to paſs with Difficulty for ſome Days, till at laſt there came on a total Suppreſſion, and the Worm advancing, ſhewed itſelf at the Extremity of the *Urethra*. I examined the Inſect, and found it meaſured above four Inches, reſembling the Worms uſually excerned *per Podicem*, of the Earth-worm kind, but whiter; which made me think at firſt they had been miſtaken, and that it had been

been that way excreted. Having directed what I thought proper, I went to the Apothecary, who has the Worm now in his Custody, to be better informed. He assures me, that, when he came to the Child, he saw a preternatural Body, hanging half an Inch out of the Glans, and lying double in the Passage: Perceiving it farther advancing, he took hold of it, and with little Difficulty drew it forth.

The Summer before last a Woman shewed me a Maggot, with a crusty red *Galea* over the Snout, and a forked Tail, which she had just then voided by the Urinary Passage.

A remarkable Conformation of the Urinary Parts; by Mr John Budgen. No. 410. *p.* 138.

XXV. In *Villâ Com' Surriae, Ockley* vulgò dictâ, anno 1711 nata est Infantula, cujus in Tergo, circa vertebras inferiores, apparuit Tumor indolens, cutis colorem, Ovique columbini majusculi magnitudinem referens, qui cum Puellâ tantoperè concrevit, ut circitèr 9, vel 10 aetatis annum, Vesicam vitulinam, aëre distentam, sed sine Cervice, planè repraesentaverit. Anno 1728. Vesicae bubulinae magnitudinem aequabat. Die 29 Jan. proxime elapso in Lecto jacenti disruptus est hic Tumor, à quo multum Liquoris, instar Urinae profluebat. Re perspectâ, invenimus Tunicas (& interiùs Materiam mucosam) Ureteres, Venas, & Arterias, tales omninò, quales Vesica habere consuevit: nec defuit commercium quoddam cum Partibus internis per foramen in vertebris Digitum hominis minorem in Abdomen admittens, quod Vasa memorata recipiebat. 2° Die Feb. 1728, horam circiter decimam nocturnam obiit Puella; & si Cadaver aperire per Parentes, huic Rei strenuè reclamantes, licuisset, credo quidèm in Abdomine, Vesicae Cervicem, & nullam aliam Vesicam inveniissemus; non enim post ruptum Tumorem vel semel minxerat.

An extraordinary Cause of a Suppression of Urine in a Woman; by Claudius Amyand, *Esq; F. R. S.* No. 422. *p.* 259.

XXVI. I was lately called to a Woman who had a Suppression of Urine, occasioned by the *Menses* collected in the *Vagina*, pressing upon the *Urethra*. She had been delivered eight Months before of two Children; after which the *Carunculæ Myrtiformes* had joined together so closely, that there was no room for any Evacuation of the *Menses*. I made a cross Aperture, whereby near three Quarts of the *Menses* collected were discharged; the Suppression of Urine was immediately removed, and the Patient cured.

An Excretory Duct from the Glandula Renalis. *Extracted from the* Giornale di Literati *of* Venice, *for the Year* 1719. No. 385. *p.* 190.

XXVII. 1. The celebrated Anatomist, Signor *Ant. Maria Valsalva*, already known by his noble Treatise *De Aure humana*, has lately made a considerable Discovery. He has found the excretory Ducts of the *Glandulæ Renales*, or, *Renes Succenturiati*, which discharge themselves into the Parts of Generation; that is to say, into the *Epididymides* in Men, and into the *Ovaria* in Women. He has read a learned Dissertation relating to this Discovery, before the Academy of Sciences in *Bologna*, in which he undertakes to prove, that those *Renes Succenturiati* are to be reckoned among the principal Organs of Generation.

2. I lately

2. I lately procured a human Body, in order to search for this Duct, which I did with all the Diligence I was capable of. I was not so happy as to discover any Duct of this kind; but, having injected the *Aorta*, I found the Arteries going to the *Glandulæ Renales* disposed, as in the Figure. Now whether that Branch of the Artery, which from the *Glandulæ Renales* goes down on both Sides towards the Testicles, without supplying any of the neighbouring Parts, might not have been mistaken by the above-mentioned learned Anatomist for an Excretory Duct, all Arteries being generally in dead Bodies free from Blood, and of a whitish Colour, I will not presume at present to determine, for want of farther Experiments.

An Enquiry into this Discovery; by Mr John Ranby, *Surgeon, F. R. S.* No. 387. p. 270.

A A the right Kidney. B B the left Kidney. C C the descending Trunk of the *Aorta*. D the right emulgent Artery. E the left emulgent Artery. F the right *Glandula Renalis*. G G the right spermatic Artery. H the left *Glandula Renalis*. I I the left spermatic Artery. K K the Ureters. *a a* a small Artery arising out of the descending Trunk of the *Aorta*, a little above the right emulgent Artery. It sends two Branches *b b* upwards to supply the right *Glandula Renalis*. A third Branch *c c* goes downwards towards the right spermatic Artery G G, and then farther in company with the same to the right Testicle. *d d* a small Artery arising out of the left emulgent Artery, near the descending Trunk of the *Aorta*, and going directly upwards to the left *Glandula Renalis* H. *e e* a small Artery arising out of the descending Trunk of the *Aorta*, a little below the left emulgent Artery. It divides into two Branches; one whereof *f f* goes upwards between the emulgent Artery and Vein to the left *Glandula Renalis*; the other *g g* downwards, towards the left spermatic Artery, and in company with it to the left Testicle.

Fig. 106.

3. I have since found the same Arteries in Women, descending in the same common *Capsula* with the spermatic Artery and Vein, to the *Ovaria*. These Arteries, very probably, are what *Valsalva* took for excretory Ducts of the *Glandulæ Renales*; the Disposition and Progress of these being very much alike to what has been ascribed to those supposed Ducts.

Continued by the same. No. 395. p. 159.

XXVIII. 1. In *Aug.* 1701. *Margaret Millar*, living not far from *Glasgow*, informed me, that her Midwife, in her last Lying-in, at 45 Years old, having violently pulled away the Burthen, she was so very sensibly affected by a Pain, which then seized her in the left Side, between the *Umbilicus* and Groin, that she scarce ever had been free from it after, but that it had troubled her more, or less, during 13 Years together; that for two Years past she had been extremely uneasy, her Belly grew very large, and a Difficulty of breathing increased continually upon her; insomuch, that for the last six Months, she had breathed with the utmost Difficulty. That in all that Space of Time, she had scarce eat so much as would nourish a sucking Child; and that for three

A Dropsy in the left Ovary *of a Woman, aged* 58; *cured by a large Incision made in the Side of the* Abdomen, *by Dr* Robert Houstoun. No. 381. p. 8.

Months together she had now been forced to lie constantly on her Back, not daring to move at all, to one side or other.

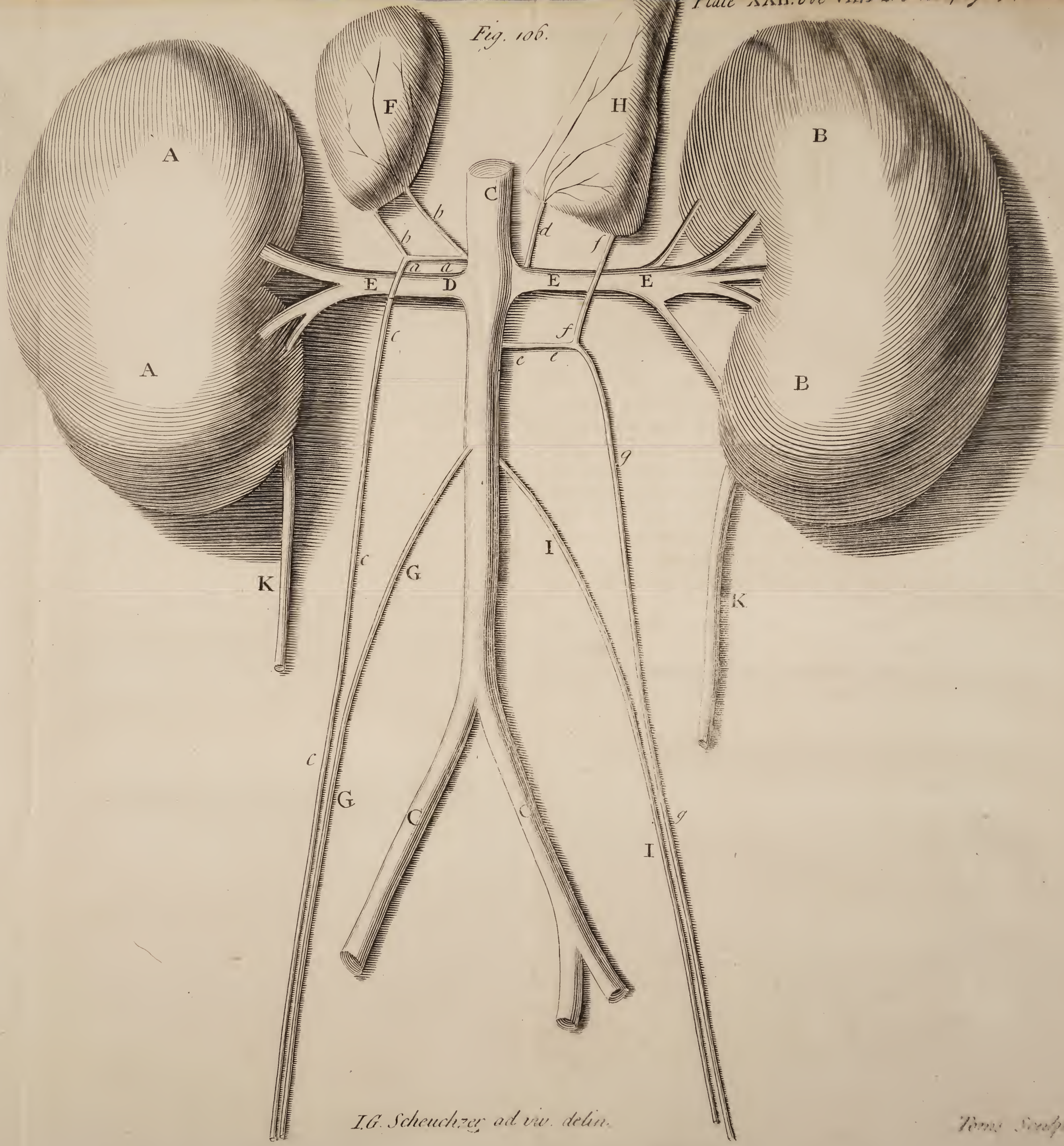
This Tumour was grown to so monstrous a Bulk, that it engrossed the whole left Side, from the *Umbilicus* to the *Pubes*, and stretched the Abdominal Muscles to so unequal a Degree, that I do not remember to have ever seen the like in the whole Course of my Practice. It drew towards a Point. Her being so long confined to lie continually on her Back, having grievously excoriated her, added much to her Sufferings, which, with want of Rest and Appetite, had greatly wasted her.

I told her, that in order effectually to relieve her, I must lay open great part of her Belly, and remove the Cause of all that Swelling: She seemed not frightned, but heard me without Disorder, and pressed me to the Operation.

I drew (I must confess) almost all my Confidence from her unexpected Resolution, so that without loss of Time, I prepared what the Place would allow, and with an Imposthume Lancet, laid open about an Inch; but finding nothing issue, I enlarged it two Inches, and even then nothing came forth but a little thin yellowish Serum; so I ventured to lay it open two Inches more. I was not a little startled, after so large an Aperture, to find it stopped only by a glutinous Substance. All my Difficulty was to remove it; I tried my Probe, I endeavoured with my Fingers, but all was in vain; it was so slippery that it eluded every Touch, and the strongest Hold I could take.

I wanted, in this Place, almost every thing necessary, but bethought myself of a very odd Instrument, yet as good as the best, because it answered the End proposed. I took a strong Firr-Splinter, wrapped some loose Lint about the End of it, and thrust it into the Wound, and by turning and winding it, I drew out above two Yards in Length of a Substance thicker than any Gelly, or rather like Glue that is fresh made and hung out to dry; the Breadth of it was above ten Inches: This was followed by nine full Quarts of such Matter, as I have met with in Steatomatous and Atheromatous Tumours, with several *Hydatides*, of various Sizes, containing a yellowish *Serum*, the least of them bigger than an Orange, with several large Pieces of Membranes, which seemed to be Parts of the distended Ovary. Then I squeezed out all I could, and stitched up the Wound in three Places, almost equi-distant: I was obliged to make use of *Lucatellus*'s Balsam, which was made by her Lady for the Use of the Poor; with this Balsam I covered a Pledget, the whole Length of the Wound, and over that laid several Compresses, dipped in warm *French* Brandy, and because I judged that the Parts might have lost their Spring, by so vast and so long a Distention, I dipt in the same Brandy a large Napkin four times folded, and applied it over

Fig. 106.



I.G. Scheuchzer ad viv. delin.

Tomo Sculp.

over all the Dreſſings, and with a couple of ſtrong Towels, which were alſo dipt, I ſwathed her round the Body, and then gave her about four Ounces of the following Mixture. ℞ *Aq. Menthæ* ℔ ß. *Aq. Cinnamomi fort.* ℔j ß. *Syr. Diacodii* ℥ vj. *M.* The Cinnamon-Water was drawn off from Canary and the beſt Cinnamon; indeed it was the fineſt and moſt fragrant Cinnamon-Water I ever taſted: Of this Mixture I ordered her 2 or 3 Spoonſuls 4 times a Day.

Next Morning I found her in a breathing Sweat, and ſhe informed me, with great Tokens of Joy, that ſhe had not ſlept ſo much, nor found herſelf ſo well refreſhed at any time for three Months paſt. I carefully attended her once every Day, and as conſtantly dreſſed her Wound in the ſame manner as above, for about eight Days together; I kept in the lower Part of the Wound a ſmall Tent, which diſcharged ſome Seroſities at every Dreſſing for four or five Days. But Buſineſs calling me elſewhere, I left her, having firſt inſtructed her two Daughters how to dreſs her Wound, and told 'em what Diet I thought moſt proper.

Her chief Food was ſtrong Broth made of an old Cock, in each Porringer of which was one Spoonful of Cinnamon-Water; this was repeated 4 times a Day, and gave her new Life and Spirits.

After three Weeks Abſence, I called at her Houſe, and finding it ſhut up, was a little ſurprized, but had not gone far before I was much more ſurprized, when I found her ſitting wrapped up in Blankets, giving Directions to ſome Labourers who were cutting down her Corn.

She mended apace, to the Admiration of every body thereabouts, recovered ſurprizingly, and lived in perfect Health from that time, till *October* 1714; when ſhe died in ten Days Sickneſs.

That this Tumour, or rather Dropſy of the *Ovarium*, proceeded from the Midwife's Raſhneſs in pulling away the *Placenta*, not knowing how to ſeparate it from the *Uterus* ſkilfully, ſeems to me plain from what the Woman herſelf told me, and what fell out afterwards. The *Placenta* adhering faſt to the *Uterus*, required more Art to bring it away than ſhe was Miſtreſs of, which probably induced her to uſe Violence; by which ſhe forced down the *Fundus Uteri*; ſo overſtrained the Ligaments, and all that is appended to them; eſpecially the *Ligamentum latum* of the left Side and it's *Ovarium*, which may be reaſonably allowed to have been hurt in the Relaxation with the reſt. Hence the Elaſticity of theſe injured Parts was not only impaired, but the ſmall Lymphatics ruptured, ſo that the extravaſated *Lympha* ruſhing out, thickned, and not being able to recirculate, dilated the injured *Ovarium*, and thus increaſed the Tumour, and the Parts being already exceſſively diſtended, and being no longer able to reſiſt the new Influx of freſh Secretions, ruptured alſo, and by degrees augmented to that huge and enormous Bulk.

A remarkable Case of a Gentlewoman who died of a Hydrops Ovarii, *in the Thirty-third Year of her Age, after having been tapped* 57 *times. By Mr* John Belchier, *Surgeon.* No. 423. p. 729.

2. In the Year 1725, the Wife of Mr. *Newberry*, a Merchant in this City, complained of a Pain in her left Side, near her Groin, internally, which ſenſibly increaſed; and perceiving a Swelling in that Part, ſhe at firſt thought herſelf with Child; but having other Symptoms, not very common with gravid Women, ſhe ſent for a Phyſician, who immediately diſcovered it to be Hydropical, and after following his Preſcriptions, for ſome time, and finding little or no Benefit thereby, ſhe ſent for another, and ſo for a third and fourth; and after between two and three Years fruitleſs Trial of proper Medicines preſcribed by the Phyſicians, ſhe growing very big and uneaſy with her Burden, was adviſed to be tapped, to which ſhe accordingly ſubmitted: And on *May* the 6th, 1728, ſent for Mr *Cheſelden*, who took from her between four and five Gallons of Water; but in a Week or ten Days, after the Operation, ſhe perceived herſelf to fill again, in which State ſhe continued to the firſt Day of *July* following, when Mr. *Cheſelden* tapped her again, and took from her about the ſame Quantity of Water as before; and in this Manner ſhe continued to fill, and be tapped every third or fourth Week, from the 6th Day of *May*, 1728, to the 3d of *March*, 173½, when ſhe died, in the Thirty third Year of her Age.

During the laſt 37 times of her Tapping, I conſtantly attended her with Mr *Cheſelden*, when ſhe always ('till the two laſt times) appeared very briſk and lively, the whole time of the Water's running from her, and was not in the leaſt ſick or faint, after the Diſcharge of the Water, as is uſual, and though ſhe was a very thin emaciated Woman, ſhe would frequently walk three or four Miles the Day before the Operation, and moſt commonly went abroad the third Day after it.

The Quantity of Water taken from her each time of Tapping was between 4 and 5 Gallons; and during the whole 57 times Tapping, there never was above a Quart, or two Quarts at moſt, different in the Quantity, 'till the two laſt times, at each of which the Quantity did not exceed two Gallons: But in the Intervals of theſe two laſt Operations, ſhe was frequently troubled with Reachings to vomit, which burſt open the Orifice twice where ſhe was tapped, and at each time diſcharged about ſix Quarts. The Quantity of Water which was taken from her each time, was always meaſured, and upon Computation, the whole amounts to near 250 Gallons. The Water that was taken from her the two laſt times of Tapping, was much more viſcid than the former.

At times ſhe frequently complained of a violent Pain on her right Side, and a heavy aching Pain in the *Pelvis*. She had likewiſe a *Prolapſus Uteri*; and ſome time before her Death, ſhe could not expel her *Fæces* but with great Difficulty and Pain, and at the ſame time laboured under an Incontinency of *Urine*.

Fig. 107.

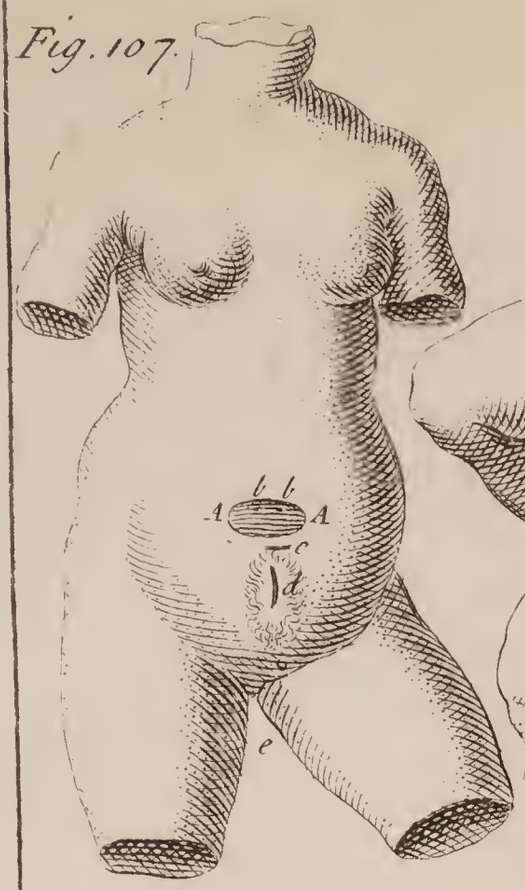


Fig. 108.

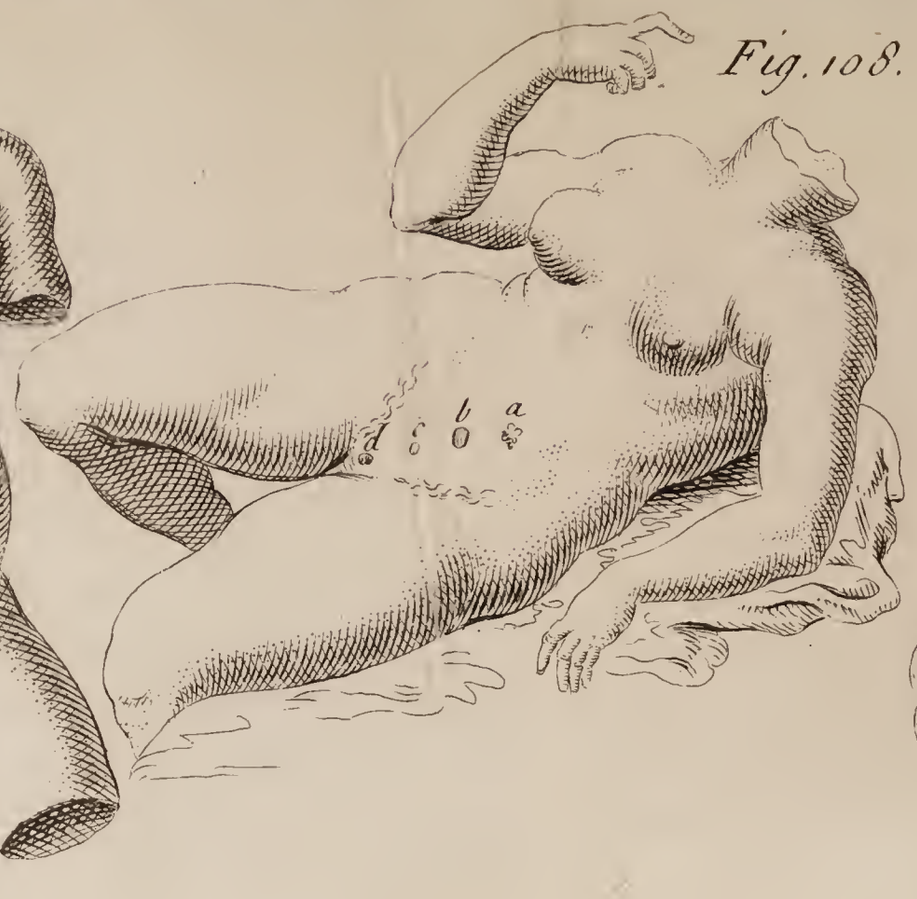


Fig. 109.

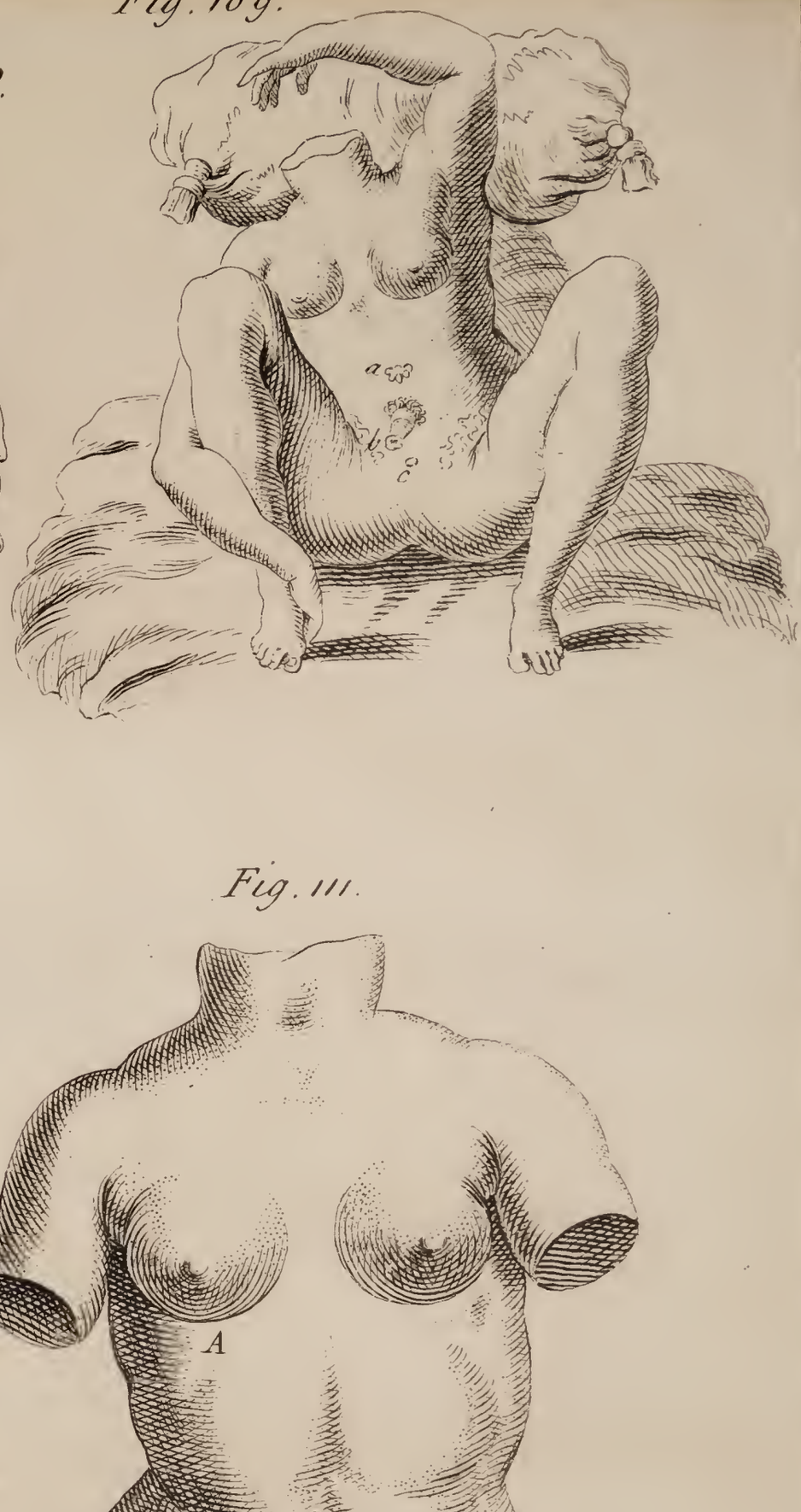


Fig. 110.

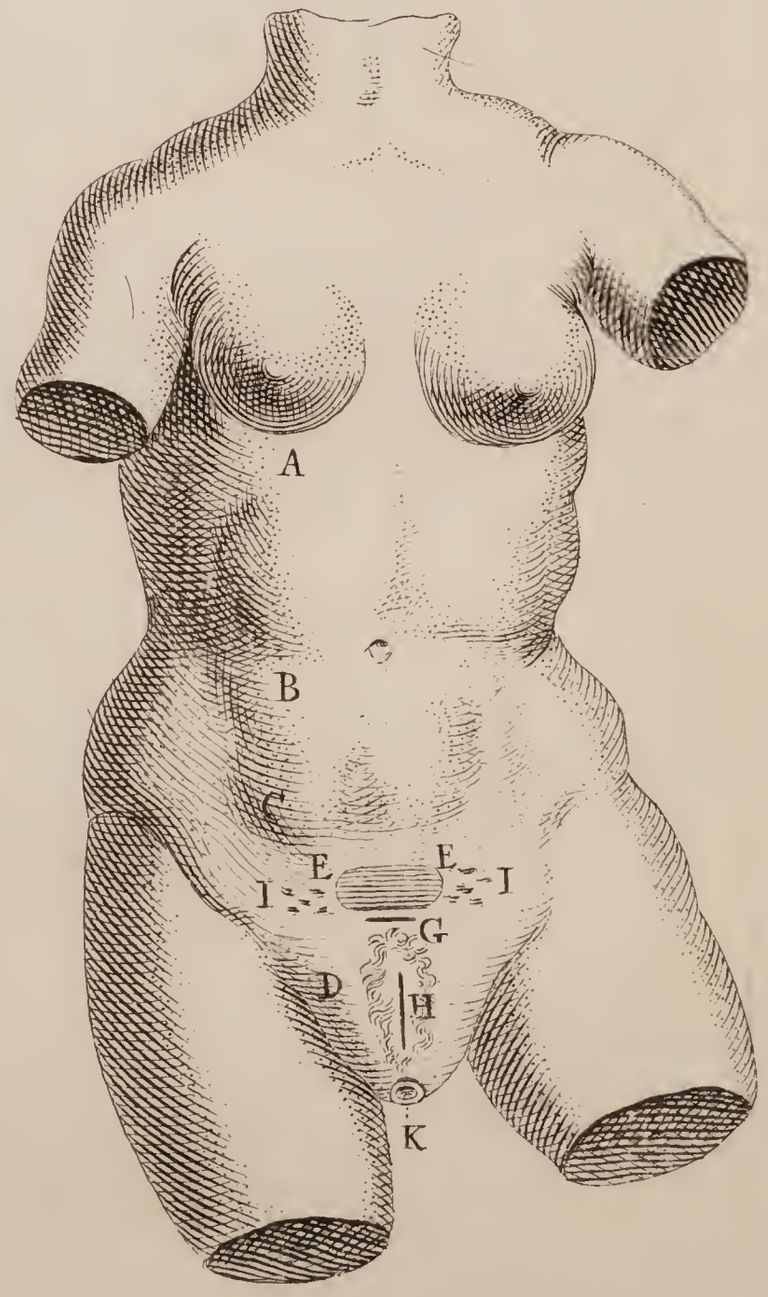
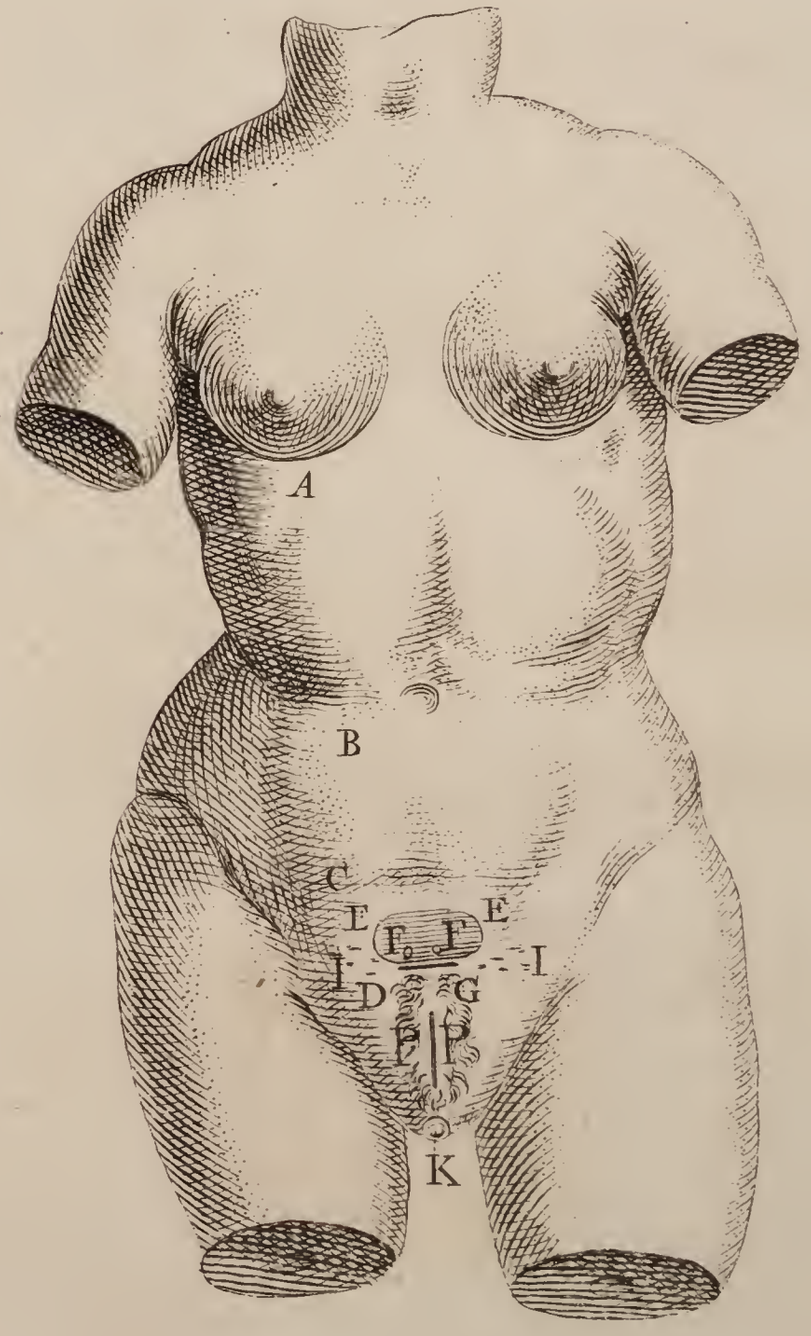


Fig. 111.



Toms sculp.

March 6th, 173½, I opened her in the Presence of her Physician, when I found the whole *Viscera*, from the *Diaphragm* to the *Ossa Pubis*, covered with a thick gelatinous Substance, which seemed to be membranous, which at it's first Appearance, I took for the *Omentum* in a putrified State; but after a farther Examination, I found it to be only the more viscid Parts of the extravasated Fluid, which could not be discharged by the Operation: After removing this, I found several Portions of a hard schirrous Substance, arising from the *Fundus* of the Stomach, one large Portion of which was inserted into that Part of the *Colon*, near the right *Kidney*, and in Appearance resembled the *Pancreatic Gland*. Another Portion, which was cylindrical, and about two Thirds of an Inch in Diameter, passed streight over the Intestines, adhering strongly to that Part of the *Colon*, which lies under the Stomach, and was inserted into the *Rectum*, in the *Pelvis*. Another Portion of this Substance passed directly over the Intestines, to the *Pelvis*, but about the Middle of the *Abdomen* it sent out two smaller Portions, the one was inserted into the *Mesentery*, the other reflecting back, was inserted into the *Colon*, on the left Side near the Stomach. As soon as I cut into one of these Portions, I discovered it to be a Part of the *Omentum* twisted up, and contained in a very thick capsular Membrane. The *Diaphragm* was forced up so far by the Contents of the *Abdomen*, that the Cavity of the *Thorax* was decreased to near one-third. The Liver was much larger than in a natural State, and of one intire Substance, and not divided into *Lobes*, the whole convex Surface adhering firmly to the *Diaphragm*. The Stomach was very small, as to it's Cavity, but the Coats of it were increased to six times their natural Thickness (as were likewise all the Coats of the *Intestines* and *Mesentery*) and very much inflamed. Two Thirds of the Stomach adhered to that Part of the *Diaphragm*, which did not cover the Liver, and the other Part adhered to the concave Surface of the Liver; as did likewise the *Duodenum*, whose Cavity was very large. Below the *Duodenum*, the *Colon* adhered to the lower Part of the concave Surface of the Liver, so that the whole Liver was contained in a kind of *Bursa*, composed of the *Diaphragm*, Stomach, *Duodenum* and *Colon*. The *Cæcum*, *Colon* and *Rectum* were much larger than in a natural State, and adhered so very strongly to the Parts over which they passed, that it was with much Difficulty I could separate them. The *Spleen* was not one fourth of it's natural Size, and one Half of it's external Surface was entirely cartilaginous. The *Pancreas* was smaller than usual, as were likewise the *Kidneys*, *Ureters* and *Bladder*; and in the *Pelvis* of each *Kidney*, there were small sabulous Concretions. The left *Ovarium* was distended to so large a Size, as to fill the whole Cavity of the *Pelvis* up to the *Os Pubis*; it's Surface was cartilaginous, like that of the *Spleen*, and in it were contained a great Number of *Hydatides* of different Sizes, whereas the right *Ovary* was no ways diseased in the least. The Difficulty and

Pain

Pain complained of in the Expulsion of the *Fæces*, naturally arise from the Pressures on the diseased *Ovarium*, at the same time that it's increased Bulk, by compressing the *Intestinum Rectum* impeded the Egress of the *Fæces*, and brought on the Inflammation of the Intestines which we observed.

The *Prolapsus Uteri*, and the Incapacity of the Bladder's retaining a proper Quantity of *Urine*, were likewise occasioned by the Pressure of this diseased *Ovarium* upon those Parts. But what seems most material in this Case, is the viscid Matter found in the Cavity of the *Abdomen*; as the Waters were originally incysted in the *Ovary*, was properly extravasated from the *Cystus*, into the *Abdomen* in the two last Operations; by which, as well the Quantity drawn off as the customary Relief, were very much diminished; in lieu of which the *Stimulus*, from such a Fluid, might reasonably bring on the Vomiting observed from that time.

Quer. Therefore, if such a Vomiting ensuing the Operation is not a fatal Symptom?

Quer. If any Method can be found to prevent such Extravasations?

The Relations of this Gentlewoman are of Opinion, that her Disease was occasioned by pulling off her Cloaths, when she was very hot, to go into a Bathing-Tub of Water to cool her, when finding the Water excessive cold, she put only her Legs in, the other Part of her Body being out of the Water, and naked at the same time; which happened a few Weeks before she perceived the Swelling and Pain in her *Pelvis*; and probably this might be the Cause. As the Constriction of the lower Parts by the cold Water might, in a great Measure, impede the *Fluids* circulating through the lower Parts, and the Blood being at the same time rarified and expanded by the Heat, might therefore burst through the more tender *Lymphatics*, and produce the Extravasation.

A preternatural Structure of the Parts of Generation in a Woman. By John Huxham, *M. D.* No. 379. p. 408.

XXIX. 1. Mulier quaedam de parochia *Lanteglass* in Comit. *Cornubiæ*, prope *Fowye* oppidum, annos nata xxiii nupta fuit cuidam Nautae robusto, tandemque praegnans, sibi partium male conformatarum conscia, opem imploravit chirurgicam. Sibi accersitum esse voluit *D. Bonnett* de *Fowye* oppido, & artis chirurgicae, & obstetricae peritissimum. Ille vero perspecto denudato corpore sequentia observavit.

Loco umbilici, in medio abdomine, paululum vero inferius, prominet massa quaedam spongiosa, carnis quasi offam prae se ferens, abdomini transverse incumbens, magnitudinis fere ovi gallinacei, longa autem tres digitos: ex hac duo erumpunt meatus urinarii exiles, qui urinam perpetim exstillant, quam neque vel retinere vel ejaculare potest; hinc vesicam, (si quae adsit) sphincter caruisse concludendum. Spongiosa haec mollisque massa, urinae acrimonia corrosa, tactum fere refugit molliſſimum, adeo ut incurvata obambulare coacta sit, ad dolorem a vestibus impressum evitandum, eamque tenuissimis linteis involvere.

volvere. Hanc quidem maſſam funem fuiſſe umbilicalem male à partu abſciſſum, male dein curatum, exiſtimo ; ne vel minima enim umbilici, niſi hic, apparent veſtigia ; quid quod & urina per urachum pervium, & in duos forſan tubulos diviſum, vel ſaltem per canales duos proprios, effluit. Priori potius credo opinioni ; quia dantur Hiſtoriae urinam per umbilicum in adultis etiam excretam fuiſſe atteſtantes. *Vid. Hiſt. de l'Academie Royale des Sciences, Ann.* 1701.

Hanc infra offam ſubintrat Vaginae foramen, ab offa diſtans breviſſimo ſpatio : ex hoc effluxere Catamenia, per hoc etiam gravida facta fuit mulier, haud magnum vero tempore coitus percepit voluptatem ; ſumma etiam Penis glans in hoc orificium vix fuit intromiſſa, multo minus ipſa virga. In hoc foramen digitum aegre introduxit Chirurgus, eo ſcilicet animo, ut ipſum uteri collum exploraret, quod tamen ne vel tactu percepit, plane autem deprehendit membranam craſſam hocce orificium ab altero inferiore, jam deſcribendo, ſeparantem.

Eo fere ipſo loco, ſuperius vero paululum, ubi in mulieribus rite conformatis adeſt foſſa magna, inventum fuit foramen alterum oblongum, ne vel minimi digiti apicem altius admittens, recto inteſtino, uti poſt partum obſervatum fuit, pervium (quod à ſectione fortaſſe accidit) : nullus autem hic occurrit Sphincter : inferius vero rectum inteſtinum, more ſolito, cum Sphincter circundato terminatur.

Orificium hoc oblongum ab orificio vaginae, abdomine maxime tumente, duos ſaltem digitos tranſverſos diſtitit, inter quae membrana deſcripta intervenit ab interiore parte, hujuſce vero Fiſſurae oblongae quaſi labiorum coalitio exterius è ſuperiore foraminis parte.

Nulla hic Clitoris, hic nulla oſſium Pubis adfuere veſtigia, niſi, quaſi Apophyſes breviores ex utriuſque oſſis Ilii parte inferiore protuberantes, oſſium Pubis rudimenta dixiſſes. Hic fuit ante partum rerum ſtatus.

Die 18 Julii 1722, hora noctis 11 [a]advocatus eſt *Bonnett* Chirurgus, ut parturienti opem ferret. Perpenſis omnibus, Foetum invenit Vaginae orificium infra dilapſum, quem muliere decumbente ſuperiora verſus propellere fruſtra adnixus eſt, ob fortiſſimos Foetus motus & graviſſimos Matris dolores, cui etiam jam ſupervenere Convulſiones, Syncope, &c. Vaginae autem orificium vix ac ne vix quidem dilatatum, ita ut illi jam jam moriendum eſſe fuerit omnium expectatio.

In hoc miſerrimo rerum ſtatu, miſericordia & humanitate adductus Chirurgus, poſthabuit omnino, quid vel ignarum vulgus, vel invidus hic garriret aut hic : anceps experiendum eſſe remedium potius quam nullum apud ſe ſtatuit, morte aliter citiſſimo ingruente pede.

Parentibus periculoſiſſimum rerum ſtatum enarravit, nil niſi à ſectione expectandum, ancipitem praedixit eventum. Annuentibus hujus miſerrimae matre, & aſtantibus, in orificium oblongum inferius ſcalpellum chirurgicum introduxit, & uno ictu coalitionem labiorum

urinam

hujuſce orificii & membranam ſeparantem diviſit: hinc in unum coivere & orificium Vaginae & oblongum inferius. Jam digitis facilis introitus, orificium Uteri internum attractavit; dilatavit paululum, caput inde ſenſit infantis: quid plura? Foetus ori intruſo digito, Puellulam vivam, probe formatam, mirantibus maxime aſtantibus, demum extraxit, quae & adhuc & viget & valet: uti etiam & ipſa Mater, quanquam poſt puerperium febre graviter colluctata eſt.

Jam à partu prolapſu ipſius Uteri divexatur, quo prolabente nec per horas 8, 10ve reducto, eam dein ſi fortius intrudas, exiliunt è meatibus urinariis deſcriptis rivuli duo ad pedis ſaltem diſtantiam; argumentum ſane Cyſtidis cujuſdam urinam excipientis: aliter revera ſuſpicaſſem meatus iſtos duos urinarios ipſorum ureterum fuiſſe orificia, hic terminantia.

Quaerat fortaſſe curioſior aliquis, quo forte modo gravida facta fuit muliercula noſtra. Illi reſponderem, Penis intruſionem ad prolem concipiendam haud abſolute eſſe neceſſariam, ſeminis autem intra vaginam ejaculationem quam maxime. *Vid. Hiſt. de l'Acad. Royale des Sciences*, 1712. *Videatur etiam Mauriceau.*

Fig. 107. A A ſpongioſam aſſimulat quaſi carnis maſſam, quam parte in fuiſſe chordae umbilicalis autumo, magnitudinis fere ovi gallinacei, tres vero digitos longam. Ex hac duo erumpunt Fiſtulae urinariae *b b*, quae urinam perpetim exſtillant, nec ex ullo alio orificio redditur urina. *c.* Orificium Vaginae, cloacae galli gallinacei quam ſimillimum, ſpiſſo quaſi ſepto circumdatum: per hoc effluxere ἔμμηνα, per hoc etiam gravida facta fuit mulier. Hoc orificium, dum perpeſſa fuit mulier graviſſimos partus dolores, nullo fere modo dilatatum fuit, quanquam anus ipſe, ob vehentiſſimos muſculorum abdominis, &c. contractiones, maxime hiaret. *d* Locum indicat, ubi inventum fuit foramen oblongum, minimi digiti apicem vix admittens. In hoc, tempore puerperii, Chirurgus introduxit ſcalpellum chirurgicum, idque ab hoc in orificium ſuperius adegit: ita ut jam à partu dehiſcat monſtroſum horrendum informe ingens foramen. Orificium ſuperius tranſverſum ab inferiore oblongo (appropinquante partu) 2 fere digitos diſtitit. Ex hoc magno hiatu ipſius uteri prolapſum ſaepiſſime nunc patitur. Ex loco etiam, ubi adfuit olim orificium inferius, jam à puerperio, partim excretae ſunt Foeces alvinae: hoc vero ante partum minimè obſervatim fuit, ita ut à ſectione forte acciderit. Orificium hoc oblongum paulo altius quam par eſt, in Figura deſignatur. *e* Anum repraeſentat paulo magis antrorſum quam in aliis poſitum: per hunc maxima foecum pars egeritur. Pudendum hoc, quale quale, eſt non denſe crinitum.

Of the ſame; by Dr William Oliver. N°. 379. p. 413.

2. Mulierem, Comitatus *Cornubiae* incolam, in hunc modum, quem jam ſum deſcripturus, à cunabulis formatam fuiſſe, matronae vicinae, & non paucis res & nota & examinata fuit, uno ore conſentiunt. Subſtantia quaedam carnoſa, ſpongioſa, floride rubeſcens, leviſſimum tactum, ob atrociſſimum dolorem inde oriundum, fugiens umbilici,

bilici, quae non ex Autopsia sed ex Chirugi narratione delineata est, naturalem locum usurpabat, & e cavitate, quae plerumque ibi est, quasi pullulabat. Ex hac excrescentia, quae nec augeri, nec minui, per multos annos sentiebatur, continuo destillabat urina, cui nec alia patuit è corpore via, neque hac potuit vel violentissimis nixibus cum impetu expelli, vel per saltum excerni, adeo ut paulatim exsudans vestes interdiu, substragulaque nocte madafaceret, inquinaret. Paulo infra, ad distantiam paene palmi minoris, orificium quoddam, longitudine unciam unam, latitudine digitum transversum aequans, sese ostendebat, ut indicem admitteret, & tamen perstringeret, satis amplum. Hac via effluebant à pubertate menstrua, unde ad Vaginam & Uterum hunc esse aditum facile patebat. Ad eandem fere distantiam, qua orificium hoc Vaginae ab excrescentia illa distabat, patuit & orificium alterum, superiore minus, digitum minimum vix capiens. Huic autem orificio cum intestino recto communicationem dari, tenuissimae faecum partes, ex eo frequenter protrusae, satis demonstrabant. Ab hoc autem Pseudo-Ano Anus verus, per quem excrementa duriora dejiciuntur, unciis quinque vel sex extitit, & naturalem fere pudendorum situm obtinuit. Pili quidem aderant, sed rari, nec margines alicujus orificii magis quam reliquorum ornantes, sed duas lineas describentes, quae à medio spatio inter excrescentiam illam & commissuras femorum cum abdomine incipiebant, & sibi mutuo appropinquantes angulum, in cujus vertice positus est verus Anus, conficiebant. Hunc in modum conformata, valetudine satis bona fruebatur virgo, & aeterna virginitate ex necessitate laboraturam concluserant omnes, quibus res innotuerat. Advenit tandem Nauta quidam, cui aes triplex circa pectus erat: Illam vidit, amavit, duxit, & non multo post impraegnavit. Gestationis tempore optime se habuit mulier, quo propemodum finito, de difficultate pariendi, non sine ratione, aderat gravis suspicio. Orificium Vaginae à viri congressu non omnino dilatabatur, adeo ut de modo impraegnationis multae inter mulierculas ortae sint disputationes. Immissionem autem Penis in Vaginam ad impraegnationem non esse absolute necessariam non est quod narrem. Exemplis turgent libri Medici. Mulier tamen de sua vita anxia Chirurgos aliquos adivit, consilium petiit, opem precata est. Unus tandem apud *Foy*, oppidum non procul à mulieris nostrae habitaculo, casu audito, re perscrutata, ad promovendum partum, si opus fuerit, operam suam navare promisit. Gestationis tempore perfecte finito, dolores aliaque symptomata partum prognosticantia illam tentaverunt. Chirugus advocatus aderat. Refert ille infantem conatus suos ad regionem pubis, illa ipsa autem ad orificium Vaginae feciisse dicit. Quid est agendum? Dixit ille incisione exitum infanti esse aperiendum; ex crudeli misericordia renuunt adstantes, ingravescunt dolores, superveniunt convulsiones, vita desperabatur. Tandem cum mortem prae foribus esse omnes judicaverunt, illam paene expirantem in manus & potestatem Chirurgi tradiderunt. Ille statim dissectionem istius Isthmi, qui inter orificium Vaginae & Pseudo-Anum erat, & haud improprie Perinaeum

Fig. 108.

rinaeum poſſit vocari, inſtituit. Integumentis exterioribus diſſectis, membrana quaedam valida & craſſa, tranſverſe locata, ſeſe in conſpectum dedit, quae Vaginam à canaliculo illo inferiore dividebat. Hac diſſecta iter ad Uterum ſatis amplum patuit, manum introduxit, os Uteri digitis dilatavit, infantem capite prehenſo in lucem tuto eduxit, matrem ad vitam revocavit. Hanc mihi ipſe hiſtoriam retulit, illa ipſa confirmavit. Rei enim novitate percuſſus *Foy* adivi, utrum verum eſſet necne ſciendi gratia. Chirurgum de ſtructura partium originali, & operatione ſua tantum non Caeſarea, ſolicite interrogavi. Omnia, ut ſupra narravi, graphice deſcripſit. A Muliere etiam ut eam inſpicerem impetravi. Illa igitur ad examen commode locata, excreſcentiam illam umbilici cavitatem uſurpantem ſuperiori deſcriptioni ad amuſſim reſpondentem inveni. Illam cum ſummo digiti leviſſime tetigerim, miſella, non aliter ac ſi gladio perfoſſa fuiſſet, diſcruciata ejulavit. Mirum ſane mihi videtur hanc mulierem cum marito ſuo poſſe congredi; ex ſitu enim partium nihil aliud cogitare poſſis quin vir rei Venereae incumbens, excreſcentiam illam, aliter prorſus intactilem abdomine ſuo duriter perfricaret. Rogata quomodo haec perficiebantur, reſpondit ſe omnia ob amorem, quo maritum ſuum proſequebatur, poſſe pati.

Haec excreſcentia ex multis lobulis, propriis membranis obductis, à ſe mutuo diſtinctis, conflari videtur. In interſtitiis horum lobulorum poruli, per quos ſtillabat urina, oſcula ſua ad ſuperficiem aperiebant. Paulo infra hiatus magnus, ex unione chirurgica duorum orificiorum ad partum facilitandum confectus, ſeſe oſtendebat. Procidentia Uteri tunc temporis laborabat, qui extra labia, ſi circumferentia illa mereatur nomen, propendens, longitudinem ſex unciarum, magnitudinem ovi anſerini aequabat. Tali procidentia ſe ſemper à partu uſque laboraſſe narravit, & quidem mirum eſſet ſi aliter accidiſſet; tanta eſt enim ad orificium Vaginae apertura, ut nihil poſſit ab extra uteri prolapſui obſtare, & Uteri corpus multo magis, quam in ſtatu vulgari, à veſica premitur. Veriſimile enim eſt urinam ad excreſcentiam illam per urachum aſcendere, & per illum ab initio fluxiſſe, quia per meatum urinarium nullum natura praebuit exitum; impoſſibile tamen eſt, ut urina per urachum ad umbilicum aſcenderet, uſque dum veſica ſit turgide repleta; ex illa vero plenitudine neceſſe eſt, ut ſemper in Uterum non parvo pondere gravaretur, & illum foras extruderet. Ut conformatio partium melius appareret, reclinata in lectum Muliere, repoſitionem Uteri tentavi. Non citius illum introducere caepi, quin urina à preſſione in veſicam repletam facta, per poros excreſcentiae umbilicalis, multis rivulis, pilum craſſiorem magnitudine non ſuperantibus, cum impetu ad plures pedes proſiliebat, fontem artificialem non injucunde aemulans. Exinanita veſica, Vaginam inverſam in naturalem ſitum facile reſtitui; reſtitutis Vagina & Utero, dehiſcebat chaſma magnum, ex poſitione corporis circulare, cujus diametrum tres pollices tranſverſos metiri credo, cujus fimbriae, potius quam labia, multis ſarcomatis inaequaliter horrebant. In ſu-

periore ejus margine interno meatum urinarium fruſtra quaeſivi, in inferiore Pſeudo-Anum facile inveni, per quem digitum ſub pubem, quae ad cartilagineam mollitiem accedere videtur, ad inteſtinum rectum immiſi, necnon contentis ejus turpiter infectum eduxi, unde credo rectum, ad tres pollices ſupra ſphincterem Ani, eſſe perforatum. Paulo ſubtus pubem, ſitum, quo aliarum ſinus ipſe pudoris gaudet, verus Anus hujus foeminae obtinet, non conſueta caligine & profunditate occultus, utpote non intra clunes poſitus.

a Excreſcentia umbilicalis. *b* Orificium Vaginae. *c* Pſeudo-Anus. *d.* Anus. *e e* Pili *Fig.* 108.

a Excreſcentia umbilicalis. *b* Os Uteri. *c* Anus. *Fig.* 109.

3. As there appears to be ſome Difference in the preceding Accounts, I take the Liberty of giving you a particular Account of what I obſerved, with reſpect to this Matter. This I am rather emboldened to do, as I repeatedly obſerved the wonderful Structure of the Parts, before the Birth approached, and before I was obliged to make the Inciſion. *Of the ſame; by Mr* John Bonnet, *Surgeon at* Foye *in* Cornwall. N°. 384. p. 142.

This Woman was about 23 Years old when ſhe was married, and ſome time after conceived. As ſhe was conſcious of the preternatural Structure of the Parts, and her Mother apprehenſive of the Danger that would attend the Delivery under ſuch unhappy Circumſtances, they applied to me about the 7th Month, in order to engage my Aſſiſtance. On viewing the *Abdomen*, I made the following Obſervations: There was no Sign of the *Umbilicus*; but about 3 Inches lower, than it is regularly placed in Perſons naturally formed, there was a ſpongy, fleſhy Extuberance, nearly of the Shape and Bigneſs of a Hen-egg; not, as is ſaid in Mr *O* . . . .'s Account, compoſed of many Lobules inveloped by diſtinct Membranes, but entirely reſembling that luxuriant Fleſh which is thrown forth in ill-digeſted Wounds, and is therefore commonly called proud Fleſh. This was exceeding tender, and on it ſhe could not bear the leaſt Touch. On the lower Part of this Excreſcence, I perceived two ſmall Orifices, the one diſtant from the other about an Inch. Thro' theſe the Urine drops continually, nor is ſhe able to contain it, but by violent Efforts can make it ſpout out near a Foot. What is ſaid in Mr *O* . . . .'s Account of it's being rendered *multis rivulis*, is certainly erroneous: The two Orifices by which it is indeed diſcharged, being now very evident, and will eaſily admit a ſmall Probe. About $\frac{1}{4}$ Inch below this Protuberance, was a tranſverſe Orifice, much reſembling the *Anus* of a Cock. Thro' this the *Menſtrua* regularly flowed: By this ſhe was impregnated. It was with ſome Difficulty I thruſt my Finger into this Orifice, in order to reach the *Os Tincæ*, which, however, I could by no means feel, it lay ſo deep; but I plainly felt a thick tranſverſe Membrane ſeparating this Paſſage from an Orifice, which is ſituated about two Inches below that already deſcribed. This lower Orifice ſeemed to be ſituated, exactly, where the *Symphyſis* of the *Oſſa Pubis* is, in Women regularly formed, ſomewhat above the Place where the natural *Hiatus* ſhould have been. I could but juſt enter the

tip of my Finger into this. There were a few Hairs ſcattered up and down irregularly about this Orifice. The *Anus* terminated as uſual, with a Sphincter, about two Inches below this lower Orifice, much more forward than uſual. So that the upper Orifice, which may be properly called the Orifice of the *Vagina*, was about $\frac{1}{4}$ Inch below the umbilical Excreſcence: The lower oblong Orifice (or another Paſſage to the Womb) was about two Inches below that of the *Vagina*; contrary to what is ſaid in Mr *O*....'s Account, who makes the ſuperior Orifice to be near four Inches below the Excreſcence, and and the lower Orifice four Inches from the ſuperior; and then ſays, the *Anus*, which he (rightly enough) makes to uſurp the Place of the *Foſſa magna* in Women naturally conformed, was 5 or 6 Inches below this. According to this Proportion, the Woman muſt be really gigantic; whereas ſhe is a ſhort little Woman: Nor do Mr *O*....'s Cuts any way repreſent the Caſe. This Woman had no *Os*, or *Oſſa Pubis*; indeed there was an *Apophyſis* jutting out from the lower Part of each *Os Ilium*, but they were far from being joined, as uſual, by a *Synchonedoſis*.

July 18, 1722, I was ſent for late at Night. I found the Woman with true Travail-pains upon her. The Throws were exceſſive violent, and the continued Agony had almoſt quite exhauſted her Spirits; but the Orifice of the *Vagina* was no way ſenſibly dilated, tho' the *Anus*, thro' the Violence of the Throws, opened extremely wide. In vain were all Endeavours, by thruſting up the Child, and putting the Mother in a proper Poſture. Vain were her own Throws and Agonies. Convulſions now had ſeized her, and Nature ſeemed to have denied a longer Life to the Mother, or an Entrance into it to the Child. I was in the utmoſt Perplexity what to do under theſe Circumſtances. On the one hand I conſidered, that if there was not a Paſſage made for the Child, and that by Inciſion, both Mother and Child muſt ſpeedily periſh. On the other hand I foreſaw the Danger and Hazard of an Inciſion, and the unavoidable Cenſure of having killed the Woman, if ſhe ſhould die under the Operation. At laſt Humanity ſo far prevailed with me, as to try a doubtful Method of preſerving Life, rather than none. I told her Mother, and the other Perſons in the Room, that Death was inevitable, without making the Paſſage wider by Inciſion, and ſo attempting a Delivery; withal apprizing them of the Uncertainty of the Event of the Operation. When they ſaw her (as they thought) juſt expiring, they delivered her into my Hands, to do with her what I thought fit. I immediately thruſt my Scalpel into the inferior oblong Orifice of the *Vagina*; ſo brought them into one. Then preſently with my Sciſſers, I ſnipped the tranſverſe Membrane. This being done, I eaſily introduced my Hand, felt the Head of the Child, and with my Finger thruſt into it's Mouth, drew forth a female Infant, living and well formed, to my own Surprize and Admiration of all. Ever ſince ſhe was delivered, in the manner recited, ſhe has ſuffered a *Prolapſus uteri*, upon the leaſt ſtanding or walking.

walking. I propoſed to remedy this by a Suture, as is practiſed in the Caſe of the *Vulva* breaking into the *Anus*; but ſhe would by no means admit of it. So that ſhe almoſt continually labours under a *Procidentia uteri*, and the Body of the Womb and *Vagina* are ſo corroded by the Acrimony of the Urine, that there are four or five Ulcers formed upon them. Beſides this Inconvenience, ſome of the thinner Parts of the Excrement are diſcharged at the Bottom of this large Cleft, and by introducing my Finger at the bottom of the Cleft, I can eaſily thruſt the top of it thro' the *Anus*; which is an Argument that there could not be 5 or 6 Inches between the oblong Orifice and the *Anus*, as is aſſerted by Mr *O* . . . . , the Diſtance being ſcarce above 2 Inches.

Fig. 110. A Epigaſtrium. B. Regio Umbilicalis. C. Hypogaſtrium. D. Regio pubis. E E. Spongioſa offa. F F. Meatus urinarii, a partu ſatis viſu faciles. G. Orificium tranſverſale. H. Oblongum orificium. I I. Cicatrices duae, ex Urinae, ut videtur, acrimonia. K. Anus, paululum anterius locatus. *Fig.* 110.

Fig. 111. P P. Fiſſura magna quatuor pollices oblonga. L. Procidentia uteri. M. Os Tincae. *Fig.* 111.

XXX. In 1723, being at *Paris*, I light on a female Subject, where the *Anaſtomoſes* of the Spermatic Arteries and Veins were as large as the ſpermatic Veſſels themſelves; ſo that the Arteries being injected with a groſs Mixture of Wax, Tallow, and Vermillion, and the Veins with the ſame, only tinged with Smalt, the Injection ran out of the Artery into the Vein, and on the other Hand out of the Vein into the Artery, ſo that where one Veſſel entered the other, the Matter injected was tinged purple. You muſt obſerve, the Arteries were firſt injected with the red, and the Veins afterward with the blue Matter.

Uncommon Anaſtomoſes *of the Spermatic Veſſels in a Woman; by* Cromwell Mortimer, *M. D. R. S. Secr.* No. 415. *p.* 373.

In this Subject, what appeared moſt remarkable, was, that on the right Side, were two ſpermatic Arteries A and B. One, A, aroſe from the very Angle made by the Emulgent and the Trunk of the *Aorta deſcendens* C, which, contrary to the common Courſe, ran under the *Vena Cava*, and ſoon after it was got beyond it, ſent out a lateral Branch, or *Anaſtomoſis*, deſcending obliquely E F into the Spermatic Vein G, through which the red Matter penetrated into the Vein; which afterwards filled with Blue, became Purple all about the Orifice of this Veſſel at F, which ſeems to confirm *Euſtachius*'s Delineations, and ſhew they are no Fictions. This Artery, A, then deſcended as uſual to the right Ovary H.

The other right Spermatic Artery, B, aroſe as uſual out of the Trunk of the *Aorta*; but at about half an Inch from it's Riſe, it ſent out an *Anaſtomoſis* I K, aſcending obliquely into the Body of the *Vena Cava* D, through which a large Quantity of the red Matter paſſed, ſo as to tinge a very broad Place at K in the *Vena Cava* purple. About an Inch below this Orifice was another *Anaſtomoſis* L M, through which the

the blue Matter penetrated out of the Vein, and made the Contents of the Artery purple at L. The right ſpermatic Vein had only this one *Anaſtomoſis* M L, in all other Reſpects as uſual.

On the left Side was but one ſpermatic Artery N, and one ſpermatic Vein O, which, as uſual, incloſed in a common *Involucrum*, made their Way to the left Ovary P. Only the Artery N took it's Riſe out of the Body of the Aorta near the Angle made by it, and the left emulgent Artery, then aſcending between the emulgent Vein and Artery, turned in an Arch at Q, over the left emulgent Vein, and ſo joined the left ſpermatic Vein as uſual, which roſe out of the left emulgent Vein, as it often happens.

There was on this Side one Thing very uncommon, and not taken Notice of by *Euſtachius* himſelf, which was a ſhort *Anaſtomoſis* R S (about a quarter of an Inch in Length) from the left emulgent Artery S, which making an Arch under the left emulgent Vein, was inſerted into the anterior Part of it at R.

Fig. 112 AB, Two ſpermatic Arteries on the right Side. C C C, The *Aorta* deſcending, and the two Iliac Arteries. D D D, The *Vena Cava* aſcending, and the two Iliac Veins. E F, L M, *Anaſtomoſes* of the ſpermatic Veins and Arteries. G G, The right ſpermatic Vein. H, The right Ovary. I K, An *Anaſtomoſis* of the ſpermatic Artery and *Vena Cava*. N Q N, The left ſpermatic Artery. O O, The left ſpermatic Vein. P, The left Ovary. R, S, An *Anaſtomoſis* of the emulgent Vein and Artery. T T, V, V, V, Arteries and Veins diſperſed on the Fat and Membranes encloſing the Kidneys.

A Fœtus that continued 46 Years in the Mother's Body. Commnnicated by Dr Steigertahl. N°. 367. p. 126.

XXXI. 1. *Anna Mullern*, of the Village of *Leinzelle*, near *Gemund* in *Suabia*, of a dry and lean Conſtitution, but otherwiſe healthful and robuſt, died at the Age of 94, after ſhe had lived a Widow 40 Years.

Six and forty Years before her Death, ſhe declared her ſelf to be with Child, and had all the uſual Tokens of Pregnancy. At the end of reckoning the Waters came away, and ſhe was taken with the Pains of Labour, which continued upon her about ſeven Weeks, and then went off upon the Uſe of ſome Medicines given her by a Surgeon. Some time after this ſhe recovered her perfect Health, except only that her Belly continued ſwelled, and that now and then, upon any Exerciſe, ſhe felt a little Pain in the lower part of it. She was after this twice brought to Bed; the firſt time of a Son, who is now a Huntſman at *Biſchoffſhein*, and afterwards of a Daughter, who is married to a Soldier. But notwithſtanding this, ſhe was firmly perſuaded, that ſhe was not yet delivered of what ſhe firſt went with, and deſired Dr *Wohnlixe* the Phyſician of *Gemund*, and one *Knauſſen* a Surgeon at *Heubach*, to open her Body after her Death. Accordingly after her Death, which happened on the 11th of *March* 1720, after four days Illneſs, her Body was opened by the Surgeon, the Phyſician before-mentioned being then dead. He found within her a hard

Maſs

Maſs of the Form and Size of a large Nine-pin Bowl, but had not the precaution to obſerve, whether it lay in the *Uterus*, or without it, and for want of better Inſtruments broke it open with a blow of a Hatchet. This Ball, with the Contents of it, are expreſſed in the following Figures.

A, A Part of the Tegument, which had adhered to a ſpongious, fleſhy Subſtance. This at firſt ſeemed to be a Maſs of Cartilage, but was afterwards found to be entirely bony. B, B, B, C, C, C, Shews the membranous Part, which was bloody. D, D, D, D, The Opening made by the Hatchet. E, E, E, E, E, Another Part of the Tegument appearing entirely bony, with ſeveral Prominences. F. A Contuſion occaſioned by the rude Manner of opening it, where there appeared ſome putrified Membranes. *Fig.* 113.

A, A, A, The Tegument, or Subſtance encloſing the *Fœtus*. B, The *Fœtus*. C, A Depreſſion, or Hollowneſs, on the right Cheek. α, The Noſe turning up. β, The Mouth flatted, but not ſo wide, as it is here repreſented. γ, The Eye cloſed up. δ, The Ear. D, D, The Arms, of which the Right was the larger, and the two Joints of that Thumb were plainly to be ſeen. E, The Protuberance of the Knee. F, Part of the *Funiculus Umbilicalis* torn, but ſtill adhering to the Navel. G, G, Part of the ſame *Funiculus*, faſtened to the bony Part of the Tegument. H, The Breaſt. I, The Mark of an Inciſion into the left Side, where the Fleſh appeared red, but was dry, and looked like ſmoaked Beef. *Fig.* 114.

Fig. 115. Repreſents two Ribs, from the left Side, of their natural Subſtance, Colour and Bigneſs. A, A, The Part joining to the *Vertebræ*. B, B, to the *Sternum*. *Fig.* 115.

This Piece is preſerved in the Cabinet of Rarities of the Duke of *Wirtemberg*.

Dr *Camerarius*, Profeſſor at *Tubingen*, in a Letter upon this Subject, takes Notice, that the Surgeon found this Maſs in a Cavity on the Woman's left Side, and that it adhered to the Membranes of that Cavity, by the intervention of a ſpongious, fleſhy Subſtance. From which Particular, and the Woman's having had two Children, during the time that this large Maſs lay in her, that learned Profeſſor conjectures, that it was not lodged in the Womb, but in the left *Fallopian Tube*, which by this Means had been very much dilated and thickned in it's Subſtance.

An Extra-Uterine Fœtus, that had continued 5½ Years in the Body. By Robert Houſton, *M. D.* N°. 378. p. 387.

2. I was ſent for in *Auguſt* 1717, to a Woman near *Newport-Market*, who had been married eighteen Years to a Native of the *Eaſt-Indies*, by whom ſhe had eight Children, beſides two Miſcarriages. At my viſiting her, ſhe was with Child in a ſecond Marriage, and her Huſband a vigorous young Man.

She was near her full Time, and had felt Pains for ſeveral Days, which, returning by Intervals, ſhe concluded, would, as uſual, bring on

on her Delivery. Her Mother, and her Midwife, apprehending no Difficulty, aſſured thoſe about her, that only Time was wanting.

But I found, on Examination, that her Womb was of no Bulk to contain a Child near it's Time; and that it's Neck, of an uncommon Hardneſs, was alſo cloſed ſo ſtraitly, as to refuſe the Admiſſion, even of a ſmall Probe or knitting Needle.

I declared upon this, that her Delivery was impoſſible, becauſe the Child was not within the Womb, but between the Womb and the Guts, that it might be removed by a Paſſage to be made for it, without any great Pain, and with Safety to the Mother. I offered to undertake it, and aſſured them, that this was the only Opportunity; and that if ſhe neglected it, it would hereafter be out of the Power of Art to give her the Relief, ſhe muſt languiſh for till Death, unleſs favoured by ſome unlikely and extraordinary Accident.

However confidently I affirmed it; they liſtened with a Mixture of Diſbelief and Amazement, and rejected my Aſſiſtance. At that time, in probability, it would have been ſucceſsful; for ſhe was a ſlender well-ſhaped Woman, in good Habit of Body, and of a ſprightly Diſpoſition.

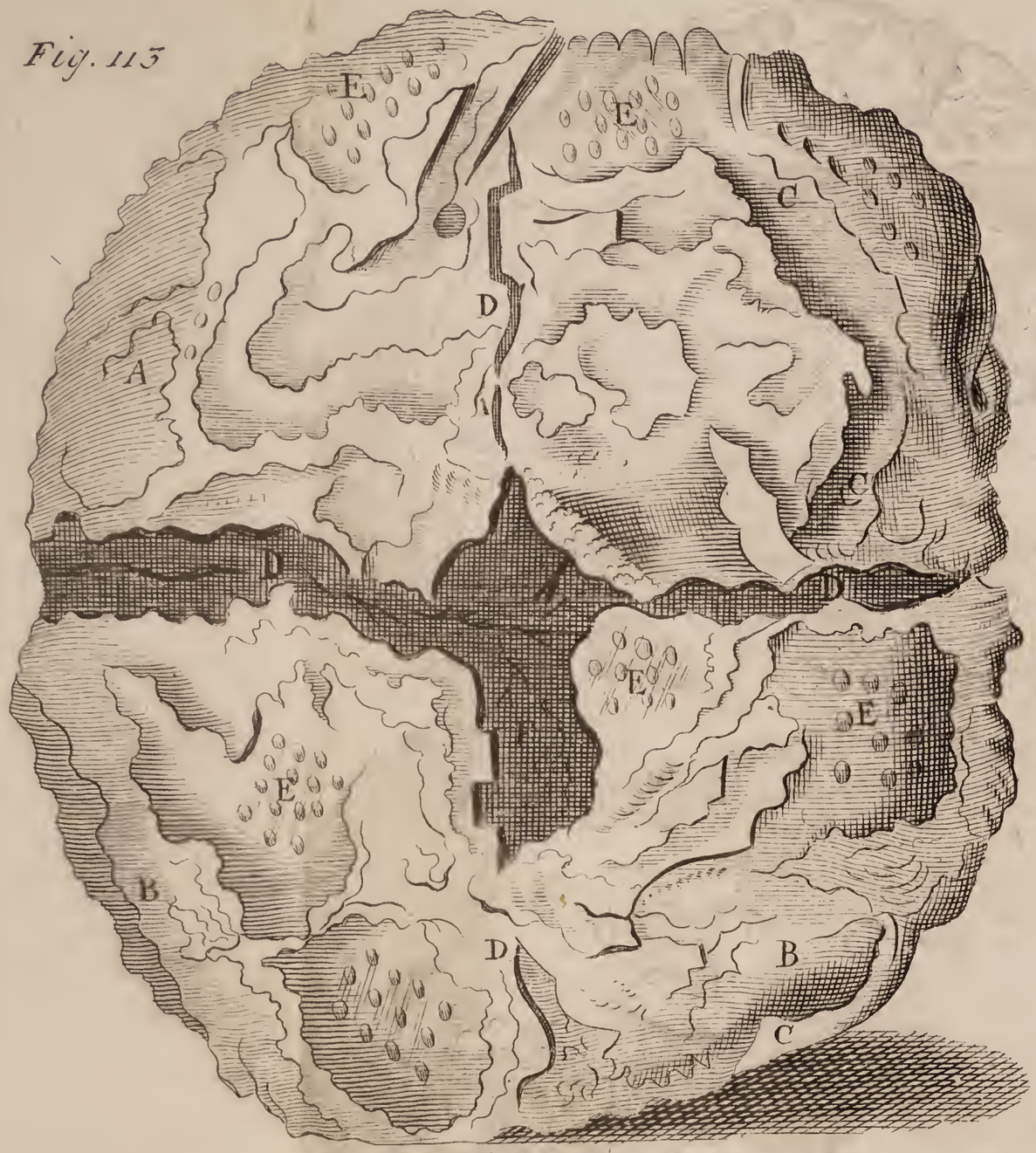
It was a Year after this, when I was deſired again to viſit her. I found her much diſordered by a growing Impoſthumation in her Belly: I ordered her ſome Cordial Stomachics, *Caſſia*, and ſuch gentle Lenitives; and they met a Succeſs beyond my Expectation: So that, by Aid of a regular Diet, and the watchful Exactneſs of a very tender Mother (a Nurſe of above thirty Years Experience about this City) I reſtored her to ſuch Strength, that ſhe went chearfully abroad, and re-applied herſelf to Buſineſs.

But about fifteen Months from the Time when I viſited her firſt, her Mother came from her to entreat my Aſſiſtance: She complained of great Pain in the lower Part of her *Abdomen*; and I found a Tumour of a conic Form, projecting about an Inch beneath the *Umbilicus*: It's Inflammation, with Tenſion, and a Feveriſhneſs attending it, ſo plainly indicated Suppuratives, that I was not ſurprized to hear, in a few Days, that it had broke, as I wiſhed. I propoſed to lay it open, both to give a free Emiſſion, and prevent it's being become fiſtulous; but ſhe was apprehenſive, that I would, as ſhe called it, cut open her Belly: So that not being able to prevail with her, I ordered a Pot of Unguent, and ſome Plaiſters. The Ulcer ſoon grew fiſtulous, and ſo continued till ſhe died, which was on the 23d of *March* 1723, it the 41ſt Year of her Age.

For above five Months before her Death, ſhe voided her Excrements by this Vent, and all the ſoft Parts of the *Fœtus*, with ſome ſmall Bones of it's Fingers. But the reſt of the *Skeleton* remaining entire, I took it out of her Body, together with the *Vagina*, *Uterus*, *Rectum*, *&c.* wherein it had involved itſelf; as may be ſeen more particularly in the Figure annexed.

A The

Fig. 113



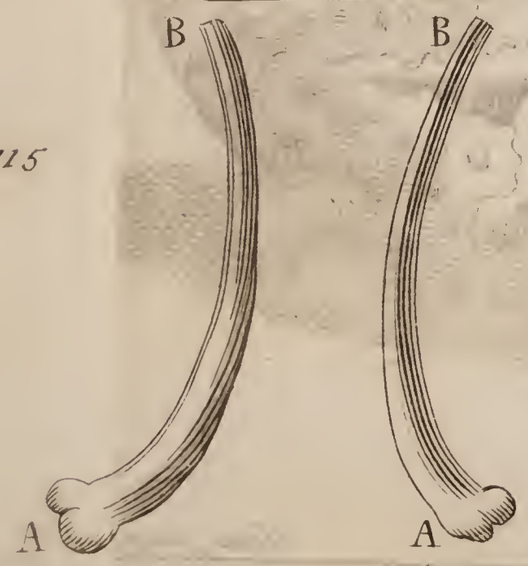


Fig 115

Fig. 114

Toms Sculp.

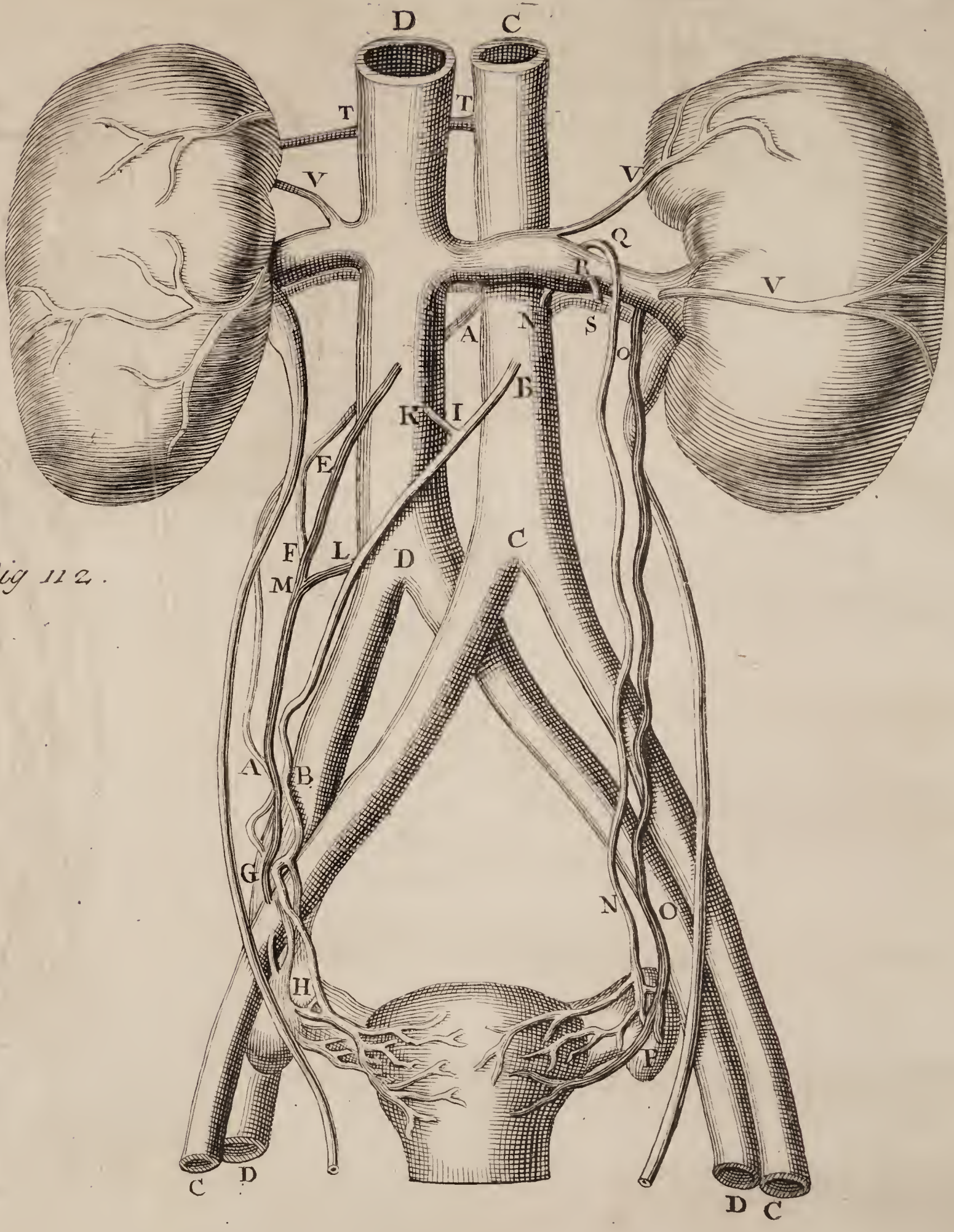


Fig 112.

Toms Sculp.

A The *Clitoris*. B B the *Nymphæ*. C the *Rima*, or Entry into the *Vagina*. D the *Bladder*. E E the *Uterus* cut off. F the *Uterus* found and entire. G the left *Ovarium*. H H the *Tubes*. I part of the *Colon* cut off. K part of the *Peritonæum*. L part of the *Ileum* cut off. M. part of the *Cæcum*. O part of the *Cranium* that plainly appears. P. the Ulcer, thro' which the Excrements paſſed, with ſome ſmall Bones. Q Q Q Q the *bulky Maſs*, wherein the *Skeleton* is contained, between the *Uterus*, part of the *Vagina* and *Rectum*. R R part of the *Cutis*. *Fig.* 116.

A *Orificium Vaginæ*. B *Anus*. C. *Inteſtinum Rectum*. D D D the Maſs wherein the *Skeleton* is contained. E the *Coſtæ* plainly appearing. F. the *Bladder* laid aſide. G the *Ureter* cut off. H the *Uterus*. I the *Ovary*. K the *Tube*. L part of the *Colon*. M the *Ulcer*, thro' which the Excrements paſſed, about one Inch beneath the Navel. N Bones in the Orifice of the *Ulcer*. *Fig.* 117. *A Lateral View.*

3. Uxor *Laurentii Skallroth*, Paſtoris in *O'Eſtad*, Territorii *Ahle* dicti, ditionis Elfsburgenſis, aetatis 41, quatuor annos nupta, A. 1720, menſe Julio, ingravidatur, fructumque fert per ſeptem menſes, viſis tamen interdum paucis menſtruis, ſed ſperans, juſto demum tempore & poſt decimi menſis faſtidia, pulcra prole parentem ſe futuram. Praeterlapſo hoc tempore, evaneſcere tumorem ſentit, remanente ſolummodo preſſione quadam in latere dextro. Poſt menſem rurſus fit gravida, peperitque filiam, ſed mortuam juſtae magnitudinis, in Decembri An. 1721. Ex quo tempore lecto adfigitur in menſem uſque Junii hujus anni. Menſe vero Maii, cum alvum levaret aliquando, anus ipſi tam dolere, ut ipſum inteſtinum rectum omnino excidere crederet: duobus ergo digitis praetentans & ſe juvare volens, extrahit cranii partem, magnitudine nummi Coronae Svethicae (vulgo *dubble Carolin*); repertis deinde in ſella duabus coſtis, & poſt 14 dies abeuntibus eadem via reliquis oſſibus, colore excrementitio, quae & ipſe vidi, & manu mea contrectavi. Maritus, uxor ipſa, & ejus ſoror, alia non via exiiſſe haec oſſa mihi ſancte adfirmarunt, incredulo licet, & contra ordinem naturae haec fieri non poſſe, ſtrenue defendenti. Bene nunc valet, domeſticis apta curis, triumque mater liberorum, qui adhuc in vivis ſunt: menſtruis quoque naturaliter ſe habentibus. *The Bones of a Fœtus voided by Stool. By Mr* Bernard Shiever. No. 385. p. 172.

4. I was ſent for about the middle of *Auguſt* laſt, to a Woman who then judged herſelf to be between three and four Months gone with Child; ſhe had all the Symptoms preceding a Miſcarriage, and upon touching, I found the *Os Tincæ* ſomewhat dilated and ſpread, from whence I concluded a Miſcarriage would enſue, and therefore ordered what I thought proper to promote it; but I was ſome time after informed by her Huſband, that although ſhe before believed that ſhe had miſcarried, yet that ſhe now thought herſelf Quick; as feeling ſomewhat to move within her Belly, agreeable to what ſhe had perceived after former Quickenings. Thus it paſſed on for about ſix or ſeven Weeks; in which Time ſhe grew much bigger, and the Motion more perceptible; ſo that there remained no Doubt of her being *The preternatural Delivery of a* Fœtus at *the* Anus. *By Mr* Giffard, *Surgeon*. No. 416. p. 435.

with Child. About the third of *October*, ſhe was ſeized with violent Pains in her Belly and Back; which daily increaſing, her Siſter, by her Deſire, came to me on the ſixth, when I went to her, and found her labouring under very great Pains, and other Complaints like thoſe preceding a Miſcarriage or Delivery: But to be better ſatisfied, and to ſtrengthen my Opinion, I paſſed up two Fingers into the *Vagina*, to examine by the Touch, whether the *Os Tincæ* began to open and ſpread. I there felt a large and unuſual Fulneſs and Tenſion, which I then judged to be the Body of the *Uterus* ſunk low into the *Vagina*, and much diſtending it, and extending backwards, and preſſing againſt the *Rectum*, ſo that the Excrements could not readily paſs, neither could ſhe, from it's Preſſure upon the Neck of the Bladder, freely make Water. I could not find the *Os Tincæ*, although I very carefully examined all about with the Ends of my Fingers; wherefore I I then judged that the *Fundus Uteri* muſt have receded from it's natural Poſition, and be bent backwards towards the *Rectum:* In which Opinion, I was the more ſtrengthened from the Fullneſs I before obſerved, ſtretching backwards; and therefore concluded that the *Os Tincæ* muſt be very forward: Wherefore I endeavoured to paſs my Fingers between the *Os Pubis*, and the Fullneſs which preſſed againſt the upper Edge of the ſaid Bone. This, with ſome Difficulty I effected, and at length, about two or three Inches above the ſaid Bone, I felt the *Os Tincæ* with the Ends of my Fingers. The Cauſe of this Situation, will more clearly appear in the Purſuit of this Account, I ordered her Anodyne, and quieting Medicines to relieve her Pains, which ſhe was obliged to repeat at leaſt every twelve Hours, with proper Cordials to ſupport Nature; and ſometimes Clyſters. Thus Matters continued to the 20th of the ſaid Month, only that for ſome Days before, a Water, tinged with Blood, came away, as ſhe imagined, through the *Anus*, and which ſhe believed proceeded from the Piles, with which ſhe was ſometimes troubled.

On the 20th, her Huſband came to me about ſix of the Clock in the Morning, telling me that the Midwife had brought away a *Fœtus*, but could not compleat her Buſineſs; whereupon I immediately went to the Midwife, who upon my coming, told me that a *Fœtus* was protruded through the *Anus*; and to confirm it, deſired me to examine, which I did immediately, and found the *Funis Umbilicalis* hanging out about two or three Inches beyond the *Anus*, and paſſing up through the ſame: I therefore paſſed my two fore Fingers by the String into the *Anus*; when I found about three Inches up, an Opening, as I then judged, into the *Uterus*, wide enough to admit the Ends of three or four Fingers, and the *Funis Umbilicalis* paſſing into it; from hence I was aſſured, that the *Fœtus* came out that Way. I endeavoured, with my Fingers paſſed into the Opening, to bring away the *Placenta*; but as it was very rotten, it tore away between my Fingers, ſo that I was forced to bring it in ſmall Pieces, and was at laſt obliged to leave a large Part of it. The *Septum*, or Partition between the

Anus

Fig. 116.

Fig. 117.

Toms sculp.

Anus and *Vagina* was entirely whole, and no Perforation through it. From theſe Appearances, I then concluded, that a Mortification muſt have begun in the *Uterus*, and ſo from it's Contiguity be communicated to the *Rectum*; ſo that Nature endeavouring to expel what was contained, and forcing it againſt this Part already mortified, and conſequently ready to give way and ſeparate upon any Preſſure made againſt it, produced this Opening, and the Protruſion of the *Fœtus* through it into the *Rectum*, and ſo on thro' the *Anus*.

There was a large Diſcharge of grumous Blood, and other Subſtances through the *Anus*, which continued coming away until the 26th of the aforeſaid Month, when the Woman died about three of the Clock in the Afternoon.

I ſhould have obſerved, that there was a Fullneſs and Hardneſs very perceptible, to be felt outwardly in the fore-part of the Belly, ſome diſtance below the Navel, from the time that the *Fœtus* came away to her Death; which upon opening the Body, I was well aſſured, was the *Uterus* forced upwards and forwards by a *Sacculus*, which being large and diſtended, filled up the *Pelvis*; and by it's Bulk preſſed the *Uterus* forwards. The *Fœtus* was perfect in all it's Parts, but much waſted and ſhrunk from it's being ſome time dead, and conſequently putrified.

5. The *Vagina*, *Uterus*, *Ligamenta Rotunda*, left *Ovary*, *Fallopian Tube*, and *Ligamentum Latum* on that ſide, together with the Hypogaſtric, and ſpermatic Veſſels on the ſame Side, were in a natural State. The *Fallopian Tube* on the right Side, we traced from the *Fundus Uteri* almoſt to the *Morſus Diaboli*; where it was confuſedly united with, and opened into the *Sacculus* hereafter to be deſcribed. The *Ovary* on this ſide, with the *Ligamentum Latum*, was dilated into a large *Sacculus* of an irregular Form, extending itſelf behind the *Uterus* (to the poſterior Paries of which it adhered) and paſſing on towards the left, was connected to that Part of the *Colon* that terminates in the *Rectum*, and the *Rectum*. In this *Sacculus* we found great Part of the *Placenta*, and the Remains of lacerated Membranes, beſides the Aperture of the *Fallopian Tube* mentioned before, and another about 4 Inches in Diameter into the Middle of the *Rectum*: That Part of the Ureter on the right Side, which lies between the *Ovary* and the Kidneys was dilated, and ſo was that Part of the *Rectum* between the Aperture into it, and the End of the *Colon*; both which were cauſed from the Contents of theſe Canals, being obſtructed in their Paſſage.

An Examination of the Parts. By Mr Edw. Nourſe, *F. R. S. Demonſtrator of Anatomy at Surgeons-Hall.* No. 416. *p.* 438.

Fig. 113. Shews the *Uterus*, with the *Sacculus* behind it, Part of the *Colon* and the *Rectum*; the *Fallopian Tubes*, *Ovary* on the left Side; *Ligamenta Rotunda*, and the *Vagina* laid open to the *Os Tincæ*. A, The *Uterus*. B, The *Fallopian Tube* on the left Side. C, The *Ovary* on the ſame Side. D, The *Ligamenta Rotunda*. E, The *Vagina* laid open. F, That Part of the *Colon* that terminates in the *Rectum*. G, The *Rectum* continued to the *Anus* under the *Vagina*. H, The *Fal-* *Fig.* 118.

lopian Tube on the right Side, whoſe Extremity opens into the *Sacculus* formed from the *Ovary*. I. The *Sacculus* extending itſelf behind the *Uterus*; wherein we found the *Placenta* and ſeveral lacerated Membranes; and from whence there was a large Opening into the *Rectum*.

Fig. 119. *Fig.* 119. Shews the Inſide of the *Sacculus* and it's Aperture into the *Rectum*. A the Inteſtine. B the *Sacculus* adhering to it. C the Opening from the *Sacculus* into the *Rectum*. D the Membranes found within the *Sacculus*. E the *Vagina* turned to the Right.

A Child born with a remarkable Tumour on the Loins; by John Huxham, *M. D.* No. 413. p. 258.

XXXII. Peperit nuperrime Domina quaedam puellulam rite elegánter ſatis conformatam, ni quod in regione Lumborum infima eminuerit Tumor, ſive Sacculus, Magnitudinis quaſi Pugni puerilis; cujus inſuper Pedes ad nates uſque retracti Poſituram Sartoris incoxantis exhibuerunt; nec eos movere ullo modo, aut extendere, potuit. Tumorem hunc perluſtrando eum ejuſdem eſſe Generis cum illis, quos Tulpius, Cap. xxix, & xxx. lib. III. obſervat. Deſcripſit ſuſpicabar: iſtum ideo Fomento aromatico & adſtringente foveri juſſi. Intra Triduum autem ſero ſumme adeo diſtentus evaſit, ut jam extima Tumoris membrana diſrupta fuiſſet; metuſque eſſet, ne rupto confeſtim Tumore, Serum ſemel & ſimul cum ipſa vita effluueret. Punctiunculam ergo ſuaſi, ut Lympha ſenſim emitteretur, edito nihilominus Prognoſtico, ſive aperietur Tumor ſive non, eum fore lethalem. Infans interea inſomnis & ejulans parum dormivit, ad Pulticulam vero ſatis apta. Quarto adeo Die Tumorem aperuit Chirurgus, facto largiore paululum quam conſuluiſſem *Orificio*, ita ut omnis intra Horas viginti effluxerit Humor. Hinc Languor ſummus & frequens Deliquium ad Biduum ſaltem; at nutrice ſana & Julap. Cardiaco, Cephalic. refecta viceſſimum ad uſque Diem Vitam perduxit, quo frigidi Sudores & Tremores aborti tremulam hanc Lucem extinxere. Inciſo Corpore obſervavimus Dorſalem Medullam ad ultimam Lumborum vertebram, nec ultra, pertigiſſe; ſed hanc inter & os ſacrum (ſi mavis primum os ſacrum) exiens per Tumoris ſive Sacculi membranas diſpertita fuit. Os ſacrum porro fuit ſolidum penitus, nec Propagines nervoſas Medullae ſpinalis (quibus apud Anatomicos Cauda Equina Vocabulum eſt) ad Crura Pedeſque tranſmiſit; quinimo ne quidem perforatum fuit omnino.

In quibuſdam ſaltem à Tulpianis Hiſtoriis ſupra citatis differt haec noſtra: neque enim aliquid matri praegnanti negatum neque vel ſe Ictu aut Foetum Imaginatione laeſerat unquam, neque Spina hujus Infantis bifida aut lacera: quinetiam nec os ſacrum ſolidum, nec Pedes contractos & immotos meminit Tulpius.

A large Spleen and ſmall Bladder; by Mr John Ranby, *F. R. S.* No. 401. p. 414.

XXXIII. A Boy aged 10 Years, was killed by a Blow on the Skull; his Spleen weighed 2 Pounds, and poſſeſſed almoſt all the left Side of the abdominal Cavity. The Bladder, when diſtended to it's greateſt Capacity, would not contain an Ounce.

XXXIV. A

Fig. 118

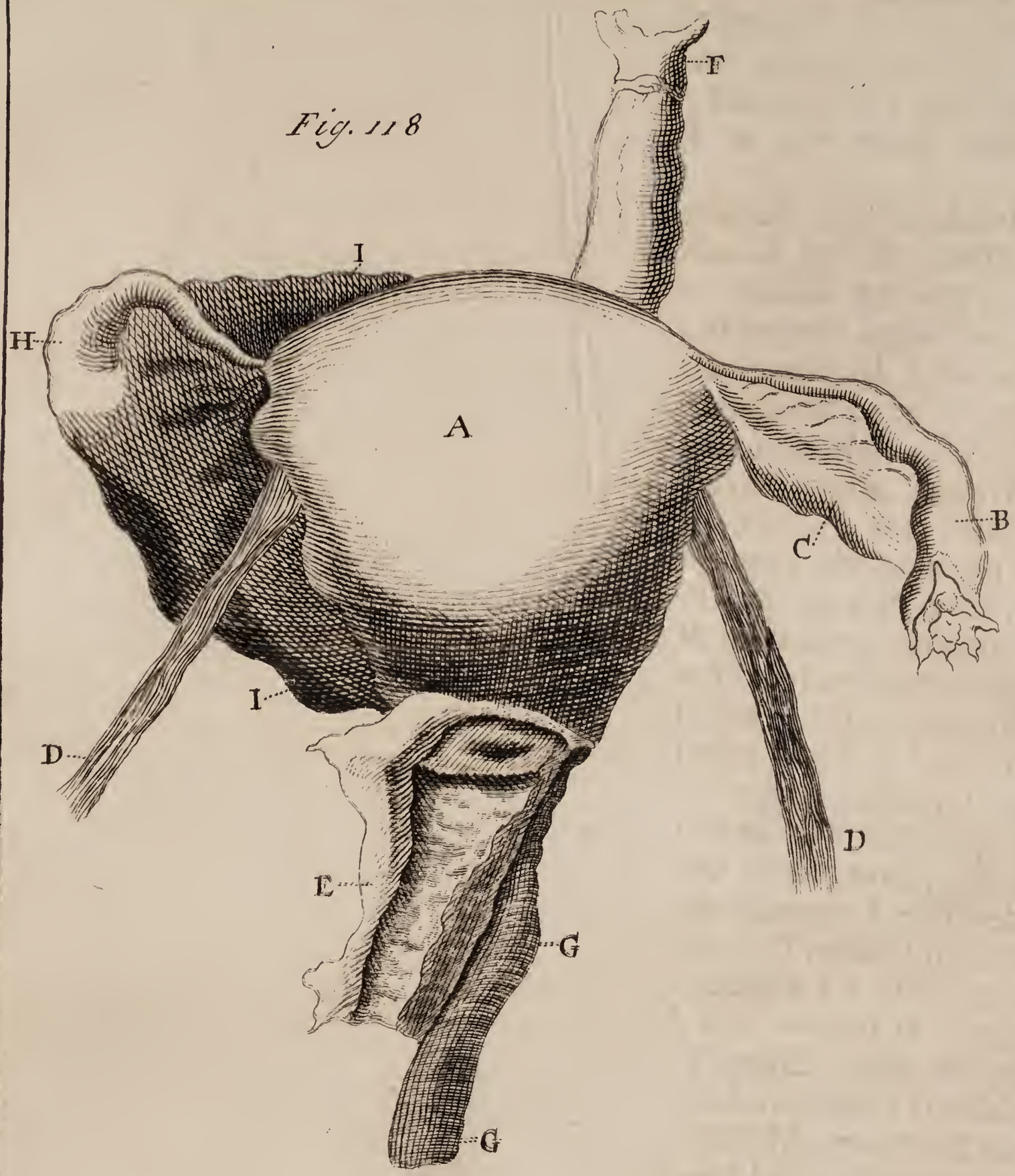
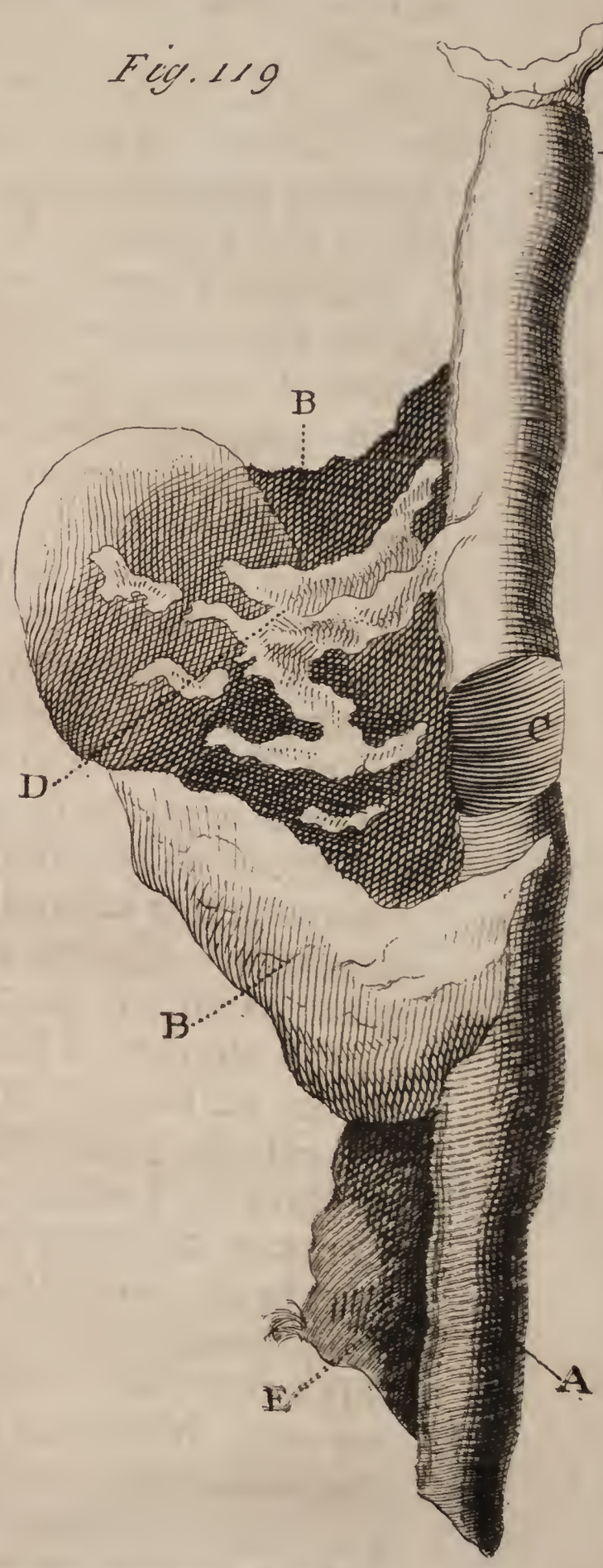


Fig. 119



XXXIV. A Man aged 25, who died of a pocky Hectic, complained ſome Days before of a painful Swelling in the Teſticles, which he ſaid came the Night before. I examined it, and finding it to be a *Hernia Aquoſa*, would have punctured it, if I had not felt (beſides the Water) a hard Body, which I could by no means reduce. In a few Days he died, which gave me an Opportunity of being ſatisfied. Opening the *Scrotum*, and ſeparating the common Membranes to the *Proceſſus Vaginalis*, I found it contained about 4 Ounces of Water, beſides a great part of the *Omentum*; ſome Portion of which adhered to the bottom of the Cavity, and the *Albuginea* that immediately covers the Teſticle.

A Hernia Aquoſa; by the ſame. No. 401. p. 414.

XXXV. In § IV he gives us a pretty Obſervation of the *Cicatricula*, as commonly called, in the *Ovaria* of Females, whence the impregnated Egg is dropt into the *Fallopian* Tubes. He ſhews, that in reality it is a *Calyx*, or natural Aperture, which enlarges itſelf for that purpoſe by degrees, and after Excluſion cloſes again, as the *Os Uteri* afterwards; ſo that the Egg truly drops from it, as an Acorn when ripe from it's Cup; and the Trace of it ſoon becomes imperceptible. He ſays farther, he has frequently ſeen the thick part of the Male Sperm carried up even into the *Fallopian* Tubes upon Impregnation.

Account of a Book, entitled, Adverſariorum Anatomico-Medico-Chirurgicorum Decas tertia. *Auctore* Fred. Ruyſch, *M. D. Anat. & Bot. Prof.* Amſtel. *R. S. S.* No. 379. p. 428.

In § V he ſpeaks of an Obſtruction, that has ſometimes happened in the Inteſtines of new-born Infants, ſo that they have had no manner of Paſſage by Stools, and that gentle Lenitives have not been able to relieve them: In this caſe, he adviſes ſtrong Purgers, adapted to their tender Age.

In § X he conſiders the *Papillæ* of the nervoſe Tunic in the inſide of the Stomach, and finds that the Figure of them is roundiſh, in that part of the Stomach over which the Spleen is fixed; but longiſh in other Parts thereof, and in the inſide of the *Jejunum*. He takes notice, that the Fabric of the Womb is made of much the ſame ſort of thick muſcular Fibres as the Bladder, both to facilitate their proper Excluſion; particularly theſe Fibres are more remarkable upon the *Fundus Uteri*, to which Part the *Placenta* moſt generally faſtens itſelf, and moſt evidently for this Reaſon.

CHAP.

CHAP. VI.

The Humours and general Affections of the Body.

Of the Globules of Blood; by Mr Anthony a Lewenhoek, *F. R. S.* N°. 377. p. 341.

I. 1. EX tuis litteris intellexi inventam tibi rationem esse, qua diametros globulorum sanguineorum, aliarumque minutissimarum rerum, certo cognoscere possis, adeo quidem ut deprehenderis diametrum globuli sanguinei cum parte $\frac{1}{1940}$ lati pollicis magnitudine convenire.

Hoc ego inventum cum legerem, summa voluptate affectus sum; statimque sic mecum ratiocinabar: si 1940 globulorum sanguineorum diametri lato pollici longitudine respondent; adhaec si corpora instar globi rotunda eam ad invicem proportionem habent, quam habet numerus cubicus ad suum axem, sicut à Geometris traditur; sequitur corpus, quod ex 7301384000 globulorum conjunctione componitur, haud majus esse corpore globoso, cujus axis latum pollicem longitudine adaequet.

Et quia de examinando denuo sanguine me rogaveras; meum ipsius & duarum praeterea personarum sanguinem visu exploravi: plane neque comperi 4 diametros globulorum sanguineorum, uti scripsisti, convenire cum diametro (*a*) fili argentei, quod mihi mittere dignatus es. Id solum dicere habeo, quod globulos quosdam sanguineos, sed perpaucos, visu perceperim; quorum quaternae diametri diametrum fili argentei longitudine aliquatenus excedebant. Verum conjiciebam globulos illos, quos ex pollice per acus punctionem eduxeram, & adhuc calentes vitro imponebam, à rotunditate figurae nonnihil desciviisse ad figuram planam.

Continued by the same. No. 380. p. 436.

2. Dicis, hanc explorationem non esse indifferentem, seu inutilem, quoniam non impossibile est, quin illa observatio de globulorum sanguineorum magnitudine in variis animalibus, una cum suis parvulis vasculis, ductura sit nos aliquando ad detectionem ubi, & quibus mediis hi globuli formentur, & inde determinatam crassitudinem in eodem animali conservent.

Ad haec mihi assumo tibi, objicere, me ad imaginationem eam adduci, nos nunquam ad explorationem illam perventuros, quomodo

(*a*) *Hujus fili argentei diametri* 485 *pollicem, sive duodecimam pedis Londinensis partem, conficiebant; quod compertum fuerat per Methodum in Actis Philosoph. expositam.* N°. 355. pag. 761.

scilicet

ſcilicet hi globuli ex materia fluida ad magnitudinis determinatae globulos ſint coagulaturi.

Multis abhinc annis ad me aſportari juſſi vinum fermentans, quia hoc Vinum globulos producit fere ſanguineis aequales, quos vini foeces vocamus: & quamvis tale vinum microſcopio apponerem, tamen nil aliud videbam, quam innumerabilem multitudinem parviſſimorum globulorum aëreorum, ſurſum ad ſuperficiem vini adſcendentium, & ſecum illos globulos, quos vini foeces nominamus, ducentium. Cum jam in ſuperficiem vini venerant, ſeparabantur vini foeces à globulis aëris, & fundum repetebant, mihi non apparente, quomodo globuli, quos dicimus vini foeces, formabantur: & ſimulac, ni fallit memoria, globuli illi inferius deſcendiſſent, exibat ex globulo quoque iterum globulus aëreus, & ita denuo ad ſuperficiem Vini devehebatur.

Imaginor mihi, coagulationem illam, ac determinatam globulorum ſanguineorum magnitudinem à rerum primordiis eſſe creatas; nam ſi unus globulus altero major erat, ſuſpicamur exinde inordinatam circulationem fore ſecuturam, quoniam ſanguinem per varia vaſcula ſanguinea rapidè transfluentem vidi, quae adeo exilia erant, ut ſimplex ſaltem globulus tranſire potuerit.

II. The Method of curing freſh Wounds in a few Days, without Suppuration, where neither Nerves, large Veſſels, Bones, or any of the *Viſcera* were concerned, has been long ago obſerved. *Purman*, a famous Surgeon of *Breſlaw*, in his *Chirurgia Curioſa*, tells us of a Mountebank, who gave himſelf 13 Wounds, by Inciſion, in the upper part of his left Arm, and thereupon applied his *Noſtrum*, and with the help of a good Roller, was cured in two Days time. *Observations upon Dr* Eaton's *Stiptic*; *by Dr* Sprengell, *F. R. S.* No. 383. p. 108.

Next he mentions a martial Stiptic, which ſtopped bleeding incomparably, and healed freſh Wounds (as he ſays) in two Days, eſpecially if the Patient took withal a few Drops inwardly. This has likewiſe been mentioned by *Blegny* near 30 Years ago.

When I came into *France*, I found that many little Trials were made there alſo, with a Stiptic Ball, mixed with *French* Brandy, by ſtriking a Cock thro' the Head, opening the crural Artery of a Dog, or chopping off a Dog's Leg, *&c.* But I found that it did not amount to any thing of conſequence; yet I have ſtill a Ball, made above 20 Years ago, of filings of Iron, and an equal Quantity of Tartar, mixed well with *French* Brandy upon a Marble; this, with ſome Alteration, was afterwards publiſhed by the famous *Helvetius*, Phyſician to *Lewis* XIV of *France*, in a Book called, *Recueil des Methodes pour la Gueriſon des diverſes Maladies*; which was reprinted in *Holland* in the Year 1710. This Preparation was then ſold by *Pierre Rottermond*, Apothecary at the *Hague* in *Holland*.

The *Recipe* for his Medicinal Ball I have tranſlated, and it is as follows: Take 4 ℔ of the Filings of Steel, and 8 ℔ of Tartar, well powdered; mix theſe well together, and put them in a new earthen

Pot, and pour thereupon as much *French* Brandy as will make it into a Poulteſs. Let this ſtand fermenting in a Cellar for 4 Days, and ſtir it between whiles. Then put it in *Balneo Mariæ*, and diſtil it ſ. a. with a moderate Fire, to draw off the Brandy. When you find that nothing but the Phlegm comes over, take it from the Fire, and take out the Maſs, ſtamp it very fine, that not the leaſt Lump may remain; then mix it again as before with a ſufficient Quantity of Brandy, and put into the Cellar to ferment, as before, and then diſtil it a ſecond time. This Operation may be reiterated 7 or 8 times, but the laſt time mix your Maſs well upon a Marble, and form it into two Ounce Balls. One of theſe Balls is ſteeped in a Pint of good *French* Brandy, a little warmed, and hung only in it by a Wire, 'till the Brandy has received the Colour of the Ball. But if you are in haſte, then grate a ſufficient Quantity of the Ball in ſome Brandy, ſtir it well, and you may uſe it that very Inſtant.

No doubt but the Author thought by often grinding, fermenting, and diſtilling this Maſs, to comminute and ſubtilize it's Particles, ſo as to make it more fit to contract the Fibres and Veſſels of a Wound, and to prevent Stagnations of the Fluids, both within and without, upon Contuſions; but the Succeſs did not anſwer, and therefore it was laid aſide. Neither did *Helvetius* ever recommend it as an univerſal Stiptic, aſtringent, or conſolidating Medicine, but merely in freſh Wounds, and that only for a firſt Dreſſing, and where People lived at a diſtance, and could not get immediately Aſſiſtance from a Surgeon. Beſides he makes ſeveral Exceptions where it ſhould not be uſed; and, in general, adviſes where Chalybeat Medicines may be made uſe of according to Experience.

But laſt Year a Balſamic Stiptic was publiſhed by one Dr *Eaton*, good to ſtop all manner of Bleeding without or within, and that without any manner of Exceptions. This made me deſirous to ſee it, and ſoon after I had an Opportunity to examine it: I found preſently that this was the ſame old Medicine, which was got hither alſo, after other Countries had diſcarded it. But I neglected it at that time, as not worth my Notice, till I ſaw lately a Treatiſe of Conſumptions, publiſhed by Sir *Richard Blackmore*, giving it the greateſt *Encomium*, that ever was given to any Invention whatſoever. For, ſays he, Dr *Eaton*'s *Balſamic Stiptic bids fair for the Credit of a certain Remedy in ſtopping of Blood outwardly or inwardly, where the* Craſis *of the Blood is not entirely ruined, and will be of more Service to Mankind, than all the Diſcoveries made by Galenical Compounders of Drugs aud ſyſtematical Methodiſts.*

Finding this Remedy recommended in ſo extraordinary a manner, by ſo eminent a Phyſician, I began now to think, that poſſibly I might have been miſtaken, and therefore deſired Mr *Winterbottom*, an Apothecary in *Bow-lane*, immediately to prepare the *Recipe*, as deſcribed by Mr *Helvetius*. When this was ready, I ſent for a Bottle of

Dr *Eaton*'s Stiptic, and tried them both with Galls before ſeveral Gentlemen ; the Tincture was the ſame, a deep Purple. I then precipitated the Contents with old Hock, and found the precipitated Matter to be the ſame in both. Not contented with my own Enquiry, I ſent ſeveral ſmall Quantities to others, and went myſelf to Mr *Godfrey*, the *Chymiſt*. They all told me, that there was no difference betwixt them. I tried ſeveral ways to find out it's balſamic Quality, from whence it has it's Name, but found none. Then, I confeſſed, it ſurprized me, that a Man who had a mind to vend a thing as a Secret, had not done ſo much as to alter it either in Taſte, Smell, or Colour, and yet this might very well have been done, without robbing it of it's Virtue in the leaſt.

My next Buſineſs was to try theſe two upon the crural Artery. Having got a good middle-ſized Dog, Mr. *Ranby* laid the Artery bare, and opened it with a Lancet the lengthwiſe of the Artery, for near half an Inch. The old Trick uſed to be, to cut the Artery croſs-ways, and then there was no neceſſity of a Stiptic at all, nor indeed here neither. But at firſt *Helvetius*'s Tincture was applied, and ſtopped the bleeding ; then we opened the Artery again, and tried Dr. *Eaton*'s with the ſame Succeſs. I then had the Artery opened in the other Thigh, and tried it only with *French* Brandy, which I found, did as the other two. I opened the Artery again, and had diſſolved in *French* Brandy a little *Sal Martis* and *Saccharum Saturni*, and applied that, and it anſwered in the ſame manner. This made me immediately conjecture, that there was but little Virtue in either of them, but only that the Brandy, by it's great Heat, did merely contract the Fibres of the Artery, which no doubt, might be a little aſſiſted by the *Chalybs* ; but this could not be much. I then reflected upon the Smalneſs of the crural Artery in a Dog, and that it was no more to be compared to the crural Artery of a Man, than a Cock's Head to a Man's Head, and that a little Pledget of Lint might ſtopped the Blood without more to do, as well as the temporal Artery when opened with a Lancet, which we did, and the Pledget of Lint ſtopt it. We then untied the Dog, and ſent him going, who ran directly home. The Miſtreſs of the Houſe tore off the Pledgets, and had the Dog well waſhed with Butter and Beer warmed, ſhe not knowing what had been done to him ; upon which the Dog fell a bleeding again, tho' not much, and the Blood ſtopped of itſelf. Thus far as to it's outward Uſe, and I could wiſh it were as harmleſs within. If only, according to *Helvetius*, it had been ordered to have been taken inwardly, in freſh Wounds and Contuſions, one might have let it paſs ; but when, without exception, Dr *Eaton* recommended it, as alſo even Sir *Richard* in all outward Bleedings, I then thought it high time to make ſome Animadverſions upon it. For Sir *Richard* himſelf ſays, in his Treatiſe of Conſumptions, *p.* 99, and 101, that in ſpitting of Blood there is an *Orgaſm*, or ſtimulating Fer-

ment: What is this but a feveriſh Indiſpoſition? And is there any Hemorrhage without it? Now, if ſo, will not Brandy and Chalybeats highten this? Which by their Heat and *Stimuli* brace and irritate the Fibres, and accelerate the Blood's Motion. And will not then the Blood take up more room, and preſs harder againſt the Sides of the Veſſels, and whatſoever oppoſes it? Is not this the way to make an Orgaſm, and cauſe an Hemorrhage?

Dr *Eaton* tells us himſelf in his Book, *p.* 57, That it did very much over-heat a Gentlewoman, and that her Bleeding ſtill continued after the taking of it, and ſhe might have periſhed if a Surgeon had not given her a cooling and aſtringent Apozeme. And but juſt before, *p.* 47, he complains of a Phyſician, that was not willing that his Patient ſhould take it, who had a Hectic Fever upon her, becauſe he was afraid that it was too hot.

Since the former Trials, on the 10th of *June* laſt, I deſired Mr *Ranby* to open the Carotide Artery of a Dog, thinking that this Artery might give me more Satisfaction than the Crural Arteries had done, to try the Stiptic Quality of *Helvetius* and *Eaton*'s Tinctures. Having laid bare the Jugular Vein, divided, and tied it, that it's bleeding might not hinder us from finding the Carotide Artery, we were obliged to cut ſome of the Muſcles thro' likewiſe, till, with ſome Difficulty, we found the Artery; which being opened with a Lancet, the Blood ſpouting forth, I applied to it *Helvetius*'s Tincture, upon which the Blood ſtopped. I took it off in leſs than a Minute, and made it bleed again, but it bled but little, and then I applied Dr *Eaton*'s Stiptic; we filled up the Wound with Lint, and ſtitched up the *Cutis*, then untied the Dog and let him run down Stairs; where, after ſome time, I ſaw him again, and found he had bled a good deal, and was ſtill bleeding. I was very well ſatisfied that, the Artery being ſo very ſmall, he would not bleed to Death, and if he had nothing but Lint upon it, it would have done as well. It muſt be obſerved, that the Carotide Arteries are largeſt in proportion in human Bodies, and that this Artery of the Dog was but a ſmall matter bigger than the Crural Arteries of the former Dog. This ſhews, that the Stiptic Quality of theſe Tinctures is very inconſiderable; and that *Helvetius*'s Tincture is rather better than Dr *Eaton*'s, if there is any difference at all; tho' that, I believe, was owing to the Brandy, for my Brandy was ſtronger than Dr *Eaton*'s.

I enquired for the Dog the next Morning, and found him alive and well, only hanging his Head on one ſide, which proceeded from the Muſcles being cut thro'.

An Aneuryſm *of the* Aorta; *by* Pierce Dod, *M. D.* N°. 402. *p.* 436.

III. 1. An *Aneuryſm*, without doubt, is a Tumour ariſing from ſome Diſorder in an Artery; but what that Diſorder is, or whence it ariſes, is not ſo well agreed, the Accounts which are given of it, being widely different and uncertain. The Name ſeems to imply, that it is a Dilatation of the Veſſel; but *Galen* deſcribes it to be a Tu-

mour, which ariſes not from any Dilatation or Relaxation of an arterial Veſſel, and the Blood therein contained ; but from an Extravaſation of the Blood from ſome Rupture of the Artery. Agreeable to this are the Opinions of all the reſt of the Antients, as likewiſe of the *Arabians*, who borrowed moſt that they have from them. *Fernelius*, as it is ſaid, is the firſt who maintained, that the Artery was only dilated, and not burſt in an *Aneuryſm*, and that the Blood was contained within the Coats of it, as it is within thoſe of the Vein in a *Varix* ; which is therefore called by ſome, ἡ φλὲψ ἀνευρυσμένη. *Sennertus* makes it to be a Dilatation, not of both the Coats, but of the outward one only, the inner or muſcular one being firſt burſten or broken, and he is followed herein by moſt of thoſe who have ſucceeded him, excepting *Wiſeman* and ſome others, who tell us, that it is nothing but an Extravaſation of the Blood, burſting thro' the Coats of the Arteries into the Interſtices of the Muſcles, and there forming a Tumour ſuitable to the Cavity that it findeth, the Artery remaing undiſtended or undilated all the while ; and that in all thoſe *Aneuryſms*, which have come to be examined, both the Coats of the Artery have conſtantly been found open.

This being the State of Opinions, with relation to an *Aneuryſm*, we had lately an Opportunity of examining farther into it, by means of a Patient, who was taken into St *Bartholomew*'s Hoſpital. She was about four and thirty Years of Age, and of a good Conſtitution, but there was a Tumour, bigger than one's Fiſt, which began from the upper Part of the *Sternum*, between the Origins of the *Muſculi Maſtoidæi*, and extended itſelf to the *Pomum Adami*, almoſt up to her Chin, and poſſeſſed all the Breadth between the two *Carotid Arteries*. The Account that ſhe gave of the Occaſion of it was, that her Huſband being a paſſionate Man, took her by the Throat one Day as ſhe was crying out upon ſome Occaſion or other, and griped her ſo hard as almoſt to throttle her. She was then with Child, and immediately perceived ſomething of a Pain a little above her Heart, and a few Days afterwards there appeared a Tumour about the bigneſs of the top of her Finger, juſt above the *Sternum*, and ſo continued without Increaſe or Pulſation, till ſhe was brought to Bed, when it began to be enlarged, upon her having a hard Labour ; agreeable to what Practitioners have obſerved, that Accidents of this Nature often happen to Women in Labour. This was about four Years ſince, and from that time it had continued gradually increaſing, until it was arrived to almoſt the higheſt Pitch of Extenſion ; and ſhe had all along been troubled with a Palpitation, Pain and Straitneſs within the *Thorax*, great Interruptions in her Reſt, and frequent Sinkings, together with a conſtant beating along the Cheſt up to the Tumour ; in which likewiſe there was a Pulſation correſpo ndent to the regular Pulſe, ſhaking the Tumour at every Stroke, and manifeſt to the Eye as well as the Touch. Notwithſtanding this ſhe was otherwiſe hearty, had her

Menſes regularly, had a good Appetite, and was moſtly chearful and lively, and never more ſo than juſt before the fatal Period of the Tumour. The *Apex* of the Tumour, which was towards the Middle, in the prominent Part of it was beginning to mortify, thro' an over Diſtenſion, and the common outward Integuments were the firſt that ſeemed to ſuffer: But the Diſtenſion continuing, the Mortification increaſed, and was quickly communicated to the outer Coat of the Artery likewiſe, which therefore ſloughed off as well as the other Integuments, and being at length wore away, juſt at the Extremity made a ſudden Aperture, about twice the Bigneſs of a Gooſe's Quill. The Blood inſtantly guſhed forth, as from a Stream or Torrent, and the poor Patient died in leſs than a Minute.

Upon opening the Body, we began from the Heart, in which there was little remarkable, except that the left Ventricle was ſomewhat larger, as were likewiſe the *Columnæ Carneæ*, than they naturally ſhould be. There was little obſervable likewiſe in the *Aorta* itſelf, till we came to the Curvature; upon the upper Side of which was the Baſis of the Tumour, forming a cylindrical Stem of four Inches long while in the Cavity of the *Thorax*; but extending itſelf into a circular Form of a larger Dimenſion, when it became external. Upon opening the under Part of the *Aorta* oppoſite to this Baſis, and carrying the Inciſion throughout it's whole Extent in the *Thorax*, the Trunk retained it's uſual Form and Dimenſions, and was not at all dilated; but in the upper Part above deſcribed, juſt on this Side the Orifice of the right *Subclavian Artery* (which was nearer than uſual to the Orifice of the left *Carotid*) there was a preternatural circular Aperture of half an Inch Diameter. Upon dividing this Aperture, and carrying on the Inciſion to the *Apex* of the Tumour, it's whole internal Subſtance appeared. The Edges of the Aperture at the Baſis of the Tumour were hard, and almoſt cartilaginous, and ſeemingly the Remains of thick and fleſhy Fibres; which upon a nicer Inſpection they appeared to be in Fact, *viz.* the broken Fibres of the inner, or what is commonly called, the muſcular Coat of the Artery; which terminating here, the Tumour immediately increaſed to 2 Inches in Diameter, and continued of that Dimenſion, till it came out of the Neck, between the Clavicles; but then extended itſelf circularly to a Diameter of above 3 Inches, the Covering of which was nothing elſe but the outer Coat of the ſame Artery all along dilated from the Baſe, even to the Extremity of the Tumour. The Cavity was for the moſt part filled with a ſort of *Polypus*, or *Sarcoma*; in which nevertheleſs there were three Sinuſes, or Paſſages, that were kept open by the conſtant Influx of the Blood, and communicated near the *Apex* with one another; (that in the middle being the largeſt) and terminating in one towards the Extremity of the Tumour, not far from where it broke.

2. An

Obſervations on Aneuryſms *in general, and in particular, on the foregoing; by* F. Nicholls, *M.B. F. R. S.* No. 402. p. 440.

2. An *Aneuryſm* is by all Authors defined to be a ſoft circumſcribed Tumour, in which there is a ſenſible Pulſation, contemporary with the Pulſation of the Artery, to which it adheres. As it is certain, that any Tumour of what kind ſoever, lying on or adhering to any conſiderable Artery, muſt neceſſarily be moved by every Pulſation of ſuch Artery, ſo this Pulſation (unleſs underſtood in ſuch manner as I ſhall hereafter explain) can no ways be admitted as the true Diagnoſtic, whereby to ſpecify the Difference between this kind of Tumour and any other. An *Aneuryſm* is found moſt commonly to ſucceed Falls, Vomitings, Labour-ſtrains, and ſuch other Motions or Indiſpoſitions of the Body as, by compreſſing the great Branches of an Artery, any ways ſtop the progreſſive Motion of the Blood. It is obvious that, as the Section of the Artery above the Compreſſure muſt in it's natural State be ſometimes very incapable of containing at once the whole Quantity of Blood, which ought only to have paſſed thro' it ſucceſſively; and as the Force of the Heart may frequently exceed the Reſiſtance it may meet with from the Coats of the Artery; ſo the Conſequence of ſuch a Stop to the progreſſive Motion of the Blood, may occaſion either a Rupture of the Artery, or a Diſtenſion of the Artery without a Rupture, or a Rupture of the internal Coats of the Artery, and a Diſtenſion of it's external Coat. A Rupture of the large Branches of the *Aorta* neceſſarily allow ſo plentiful Effuſions of the Blood, as to occaſion immediate Death; while the Capillaries may be burſt without any other Injury, but a ſlight *Ecchymoſis*, and the Tumour formed by the Effuſion from them will be diffuſed and ſuperficial. A Rupture of the mean Branches (ſuch as deſcend between the *Tibia* and *Fibula*, the *Radius* and *Ulna*, &c.) will be attended with a conſiderable Effuſion of Blood; but as the Blood will find a Paſſage between the Interſtices of the Muſcles, it will never form a circumſcribed Tumour. However, the Effuſion being continued *per ſaltum* thro' the ruptured Artery, will give a faint Pulſation, and conſequently ſome Reſemblance of the *Aneuryſm*; for which Reaſon it is by ſome Surgeons termed a *Baſtard-Aneuryſm*. Whether or no an *Aneuryſm* be a Tumour formed by the *Dilatation* of the Artery, or by a *Rupture* of the *internal* Coats of the Artery, and a *Diſtenſion* of the *external*, has for ſome time been a Matter of great Diſpute; each Party proteſting (perhaps too unjuſtly) againſt the Poſſibility of the others Opinion. As to the Poſſibility of an Artery's being dilated, it ſtands ſupported by Reaſon and Autopſy. We find the Uterine Arteries conſtantly increaſed in Thickneſs and Diameter, in proportion as the *Uterus* is diſtended; and many Caſes of Palpitations of the Heart have been attended with great Dilatations of the *Aorta*; Inſtances of which I have ſeen both in human and brute Subjects. Such a Dilatation will neceſſarily follow a conſtant, or frequent Preſſure on any Part of the *Aorta*, provided ſuch Preſſure does not entirely ſtop the progreſſive

Motion of the Blood through the *Aorta*. But on the other Hand, ſuch a Dilatation will always retain ſomewhat of the Form of the Artery. The Reſiſtance will not be every way equal, as in the extravaſate Tumours; becauſe the quaquaverſal Preſſure of the Blood will be controlled by the Preſſure on the Artery, and the Reſiſtance from the Coats of the Arteries, ſo as neceſſarily to form a Cylindroid, and the Conſequence of ſuch a Dilatation cannot (if conſidered abſtractedly from it's Preſſures) be worſe (if ſo bad) than from a varicous Vein. Again, they who conceive an Aneuryſm to be a *Rupture* of both Coats of the Artery, oppoſe their Opinion, who imagine the internal Coat to be ruptured, and the external to be diſtended, by comparing the two Coats in Queſtion, and urging, that, as the internal Coat is ſo much thicker than the external, it ſeems impoſſible, the laſt ſhould be ſufficient to reſiſt a Force capable of deſtroying the firſt. Were theſe two Coats ſimilar, as to their Structure, we might then compute their Strength by their Thickneſs, and this Argument would be of much greater Force than at preſent it can be; becauſe the internal Coat being compoſed of annular *Faſciculi*, whoſe Sides have but a very weak Coheſion, their Power of reſiſting will not be meaſureable by the Strength of thoſe *Annuli*, but by the Force with which they adhere laterally. And on the other Hand, the external Coat being compoſed of Fibres equally interwoven, and of a quite different Compoſition, it may either exert a greater Reſiſtance, or be capable of much greater Dilatations than the internal. But that *Autopſy* may evince the Truth of this Difference in the Strength of theſe Coats, it will be found by any one who pleaſes to try the Experiment, that by blowing into the Pulmonary Artery, the internal Coat will ſoon burſt, and the external Form itſelf into aneuriſmous Tumours (*which Experiment was accordingly tried before the Society, to their Satisfaction*).

Upon conſidering all which, and having, by *Order of the Society*, both privately, and publickly examined the Aneuryſm before us, which I find to be round like other extravaſate Tumours, unleſs when controlled by any notable Preſſure, and that the *Sacculus* does not divide into Coats, as the Artery from whence it ariſes does, I am induced to think that this Aneuryſm is a Tumour formed by the Blood's being forced through the *Ligamentous*, or what is called the Muſcular-coat, and diſtending the membranous or outer one. And becauſe the Impetus of the Blood will, as it were, perpetually preſs through the Aperture into the Tumour, and be again (at leaſt in Part) returned by the Elaſticity of the external Coat; therefore ſuch a Tumour will rather have a pulſatile Dilatation, than a *Pulſation*, for it's true Diagnoſtic.

IV. Mr

An Ossification of the Crural Artery. By Mr Edw. Naish, *Surgeon in* York, No. 369. *p.* 226.

IV. Mr *Consett*, of *Cleveland* in *Yorkshire*, a Gentleman of 67 Years of Age, who all his Life before had enjoyed a perfect good State of Health, sent for me on Account of a Mortification, which began a Month before on one of his Toes, and by gradual Advances, in that time had reached half way his Leg; and this without any manifest Cause. The Gentleman saw himself dying daily by piece-meal; heart-whole, as he expressed it, and had a pretty good Pulse. I proposed Amputation, as the only Remedy, which (I told him) would give him some Chance for his Life; though the odds was against him. This he readily consented to, and as soon as I could get my Dressings ready, I went about the Operation.

The Leg being taken off at the usual Place, (which was 4 Inches above the Mortification) about 2 or 3 Ounces of Blood issued out from the Muscular Part, but upon slackening the Turniket, in order to look for, and tie the Artery, not one drop of Blood flowed out, to my no small Surprize. And upon feeling the Extremity of the *Artery*, I found it hard and callous; however, I secured it by a Ligature, as usual, and dressed the Stump. The Patient (who had born the Operation with the greatest Resolution) being put to Bed, I was desirous to examine the Leg; and having dissected the *Artery*, with it's two considerable Branches as far as the *Tarsus*, I found them for the most part ossified; that is to say, the Trunk, where it was amputated, was ossified about two-thirds of it's Circumference. About $\frac{1}{4}$ Inch lower, the whole was bony; leaving so small an Orifice, that it would only admit of a Hog's Bristle; not to a very fine Probe, of I endeavoured to introduce. A little lower, it was one side bony, on the other membranous; then again an entire Case of Bone. Here and there, for the breadth of a Barly-corn, there would be no Bone at all. I opened about 2 Inches of the internal Branch immediately above the *Malleolus*, it appearing blacker than the rest. After it had been washed, I found in it about 2 or 3 drops of coagulated Blood; and now it is expanded and dried, it is one entire *Lamina* of Bone, as thick as the Shell of a Pigeon's Egg, and of an unequal Surface. I dissected three Ramifications of this internal Branch into the Foot; only one of them had a very small bit of Bone in it, about $\frac{1}{2}$ Inch from the Trunk. The other great Branch, that runs on the Ligament, that ties the Fociles together, was not so much ossified as that which I have described. This Ossification (which is the compleatest of any I have yet heard of) was, no doubt, the cause of the Mortification, and of the Death of my Patient, which followed four days after the Amputation. I must observe, that this bony Shell, or *Lamina*, was contained within the Tunicles, or Coats of the Artery.

The Use of the Bile *in the Animal Oeconomy, founded on an Observation of a*

V. Mr *Menzies*, Sergeant in the Second Troop of Horse-Grenadier Guards, was wounded about 3 of the Clock in the Morning, *Octob.* 30, 1728, and died *Nov.* 5th in the Morning, being the 7th Day after he was wounded, in the 40th Year of his Age.

I was

Wound in the Gall Bladder. *By* Alexander Stuart, *M. D. F. R. S.* No. 414, *p.* 341.

I was called *Nov.* 2d, about 11 in the Forenoon, being the 4th day after he received the Wound. The Surgeons, who had attended him from the beginning, being preſent, told me, his Belly had been diſtended, as I ſaw it, from the beginning, giving the Appearance of a Tympany, or Aſcites, and it continued at the ſame Pitch of Diſtenſion, neither diminiſhed, nor ſenſibly encreaſed to the Time of his Death. He had no *Ructus* or *Flatus*, upwards or downwards, nor *Borborygmi*, notwithſtanding this Diſtenſion of the Belly. He never went once to Stool after he received the Wound, though pretty ſtrong Purgatives and ſeveral Clyſters had been given for the three Days before I came; and though no Opiat (which might have been ſuppoſed to have retarded their Operation) had hitherto been exhibited: Neither had thoſe Purgatives nor Clyſters, which I ordered afterwards, the leaſt Effect. He took what was thought, a ſufficient Quantity of Drink, and liquid Food. He never ſlept, or but very little, by ſhort Slumbers, of about half an Hour, or an Hour at longeſt, and that very rarely, notwithſtanding pretty large Doſes of Opiats were given to procure Reſt, after I came. The Wound in the *Integuments* never digeſted in the uſual Manner; but looked flaccid, or flabby, and pale, almoſt without Pus. The *Urine*, in very ſmall Quantity, at moſt two or three Spoonfuls at a time, clear but yellow, as if tinged ſlightly with Saffron, and without Sediment. His *Pulſe* was full, ſtrong and even, but not quick. No feveriſh Heat to be felt in the Skin, on any Part of the Body. His *Tongue* not hard, rough or black, as in a Fever, but of it's natural Colour, with a ſilky Drineſs, and very little *Saliva*. He was not in the leaſt delirious, from the beginning to the time of his Death. He had ſome ſlight Fits of the Hickup the ſecond Day after I ſaw him, and ſome few Reachings to vomit; ſome Intermiſſions in his *Pulſe*, ſometimes one in 10, 15, 20, or 30 a day before his Death.

The Body being opened, the *Abdomen* appeared diſtended as in a Tympany, or Aſcites, and the Skin of the Belly tinged yellow as Saffron in many Places. A triangular Wound appeared about two Inches on the right Side of the Navel, the Direction ſlanting upwards, obliquely through the Integuments. The Belly being opened, diſcovered the Wound to have penetrated through the *Peritonæum*, and the Sword had ſlanted upwards from thence along the *Omentum*, grazing ſlightly upon it, which was ſuperficially ruffled, but ſo as to be hardly perceivable. A ſmall triangular Wound appeared in the Bottom of the *Gall-Bladder*, which had penetrated through the Membranes into it's Cavity, but had no where wounded the Liver, nor any of the Neighbouring Parts. The *Gall-Bladder* was flaccid or collapſed, containing only a few Drops of Gall, which, by preſſing the *Cyſtis* ſlightly, flowed out into the Cavity of the *Abdomen* through the Wound. The *Guts*, throughout their whole Tract being diſtended, ſo as could be judged to triple the Extent of their natural Dia-

meters

meters, ſeemed to fill the whole Cavity of the *Abdomen*, ſo as to give the outward Appearance of a Tympany, or Aſcites; which Diſtenſion diſappeared, and the *Guts* collapſed, upon making ſeveral Punctures with a Lancet in their Sides, to give Vent to the Air. The reſt of the Cavity of the *Abdomen*, which was not cloſely filled up by the diſtended *Guts*, contained a groſs muddy Water, or Serum, intenſely yellow, or highly tinged with Gall, to the Quantity of three Quarts, as I was able to gueſs without meaſuring it. All the *Guts*, and Contents of the *Abdomen* were highly tinged with this yellow Liquor, but no other Part of his Body, out of the Contact of this Liquor, had the leaſt Appearance of it. No Inflammation appeared in any Part of the *Guts*, or in any of the *Viſcera*, or Contents of the *Abdomen*, which were all ſound and healthy. The Obliquity of the Wound through the *Integuments*, *Muſcles*, and *Peritonæum*, made it impoſſible for the external Air to enter into the Cavity of the *Abdomen* that Way.

In order to make ſome uſe of this Caſe, it muſt be obſerved, That the great *Apparatus* in the *Liver* and *Spleen*, two of the largeſt *Viſcera* in the Body, confeſſedly deſigned for the Preparation and Secretion of the *Bile*, and the Place of the *Inteſtines*, into which it is immediately depoſited, afford indeed a ſtrong Argument for the univerſal Uſe of it in the Animal Œconomy, but do not directly point out what, or how many theſe Uſes are, about which there has been a great Variety of Opinions.

But this ſingular Caſe, which muſt have happened very rarely, if ever before (wherein none of the *Viſcera*, but the *Gall-Bladder* was wounded, and by that Wound, nothing but the *Gall* was loſt or miſplaced) by ſhewing how many Functions in the Animal Œconomy were impaired or deſtroyed by the ſole Want of it, does at the ſame time point out the Uſe and Neceſſity of it towards Health, or the Perfection of theſe Functions; and perhaps may lead to ſome Indications of Cure, in Caſes wherein it is known to be deficient, faulty, or redundant.

There was no other apparent or aſſignable Cauſe for theſe various Symptoms during his Life, of Death itſelf, and of thoſe ſeveral Appearances in the Body diſſected after Death, but this Wound in the *Gall-Bladder:* And as this Wound could not affect any of the Parts, nor produce theſe Symptoms in any other Senſe than as it gave Vent to the *Gall* into the Cavity of the *Abdomen*, and deprived the Cavity of the *Inteſtines* and the *Blood* of it: Therefore from this Loſs, and miſplacing of the *Gall*, all theſe Symptoms and Appearances may juſtly be concluded to ariſe, and I think may be accounted for from that Cauſe in the following Manner:

1. The *Abdomen* was diſtended, as in a Tympany, or Aſcites, from the Beginning, and the *Guts* appeared inflated to their utmoſt Diameters.

It is true, that this Inflation and Diſtenſion happens to moſt a few Hours before Death, and to all ſoon after Death, and ariſeth from the Springs, or Elater of the Air included, getting the better of it's Antagoniſt Spring, or Elater of the muſcular Fibres of the *Stomach* and *Guts*, which have no longer the Aſſiſtance of the *Blood* and *Spirits* to contract them, and keep up their periſtaltic Motion. But the Inflation and Diſtenſion here ſpoken of, was ſeveral Days before Death, and, as I have been told, the very next Day after he received the Wound, though the *Pulſe* was apparently ſtrong and equal, and therefore a defect of *Blood* and *Spirits* not to be ſuſpected; and therefore it may be juſtly concluded, that the Influx of the *Gall* into the Cavity of the *Guts*, is as neceſſary to the Strength of their Contraction and Perfection of their periſtaltic Motion, as that of the Blood and Spirits into their Sides; and that theſe three are the conjunct Cauſes of this Motion in Health, which would be defective by the total want of any of them. Hence we ſee, that in Schirrhoſities of the *Liver*, where the Secretion, and therefore the Excretion of the *Bile* is more or leſs defective; and in the *Jaundice*, where, by ſome Obſtruction in the *Biliary Ducts* after Secretion, a Part of it is forced back, and regurgitates into the Blood, and very little of it is thrown into the *Guts:* I ſay, in thoſe Caſes we obſerve an uncommon Diſtenſion in the *Guts*, and Coſtiveneſs; which, if the Caſe proves incurable, terminates in an Aſcites, or Dropſy, in the Cavity of the Belly. It may alſo be worth while to enquire, whether that which is commonly called an Hyſteric, or nervous Cholic, generally attended with a leſſer Degree of ſuch like Diſtenſions, with *Flatus's* and *Borborygmi*; I ſay, whether this Diſtemper, wherein the animal Spirits are ſo much, and only accuſed, does not partly ariſe from a ſluggiſh Secretion and Excretion of the *Bile*, occaſioning a Defect in it's Quantity; or from it's Acrimony and great Viſcoſity, occaſioned by it's Stagnation in the *Gall-Bladder*; or from both theſe, as well as from a defective or unequal Diſtribution of the Blood and Spirits in the Parts affected. In Confirmation of which, I have generally obſerved, that at ſome time or other in the Cure, a great Evacuation of porraceous viſcid *Bile*, brought away, either by Art or Nature, as well as a great Profuſion of pale *Urine*, finiſhed the Cure for that time. The vomiting of porraceous *Bile*, very common in ſuch Caſes proves the ſame; and, I believe, it is generally allowed, that the ferruginous, porraceous and black Colour of the *Bile*, are owing to ſhorter or longer Stagnations of it, chiefly in the *Gall-bladder*, which the ſedentary Life of thoſe who are ſubject to theſe Cholics, will ſufficiently account for, even if there was no other Error in their way of living; and, whoever has obſerved the high yellow Colour and Contents of the *Urine* in a *Jaundice*, ariſing from a Redundancy of *Bile* in the Blood, will readily acknowledge that an uncommon watery Paleneſs in the *Urine*, where no more than the uſual Quantity of Fluids has been taken down to dilute it, does

does ſhew a Defect of *Bile* in the Blood; and I believe it is eaſy to account for the *Flatus's*, *Borborygmi*, Inverſions of the periſtaltic Motion, the *Pila Hyſterica*, *Palpitations*, *Scotomia*, *Vertigo*, and other Symptoms of theſe Diſtempers, which are called Nervous and Hyſteric, from the ſame Cauſe. And hence it is, that Bitters and Steel, known *Deobſtruents* of the *Liver*, and *Correctors* of the *Bile*, with gentle Chologogues in very ſmall Doſes, are of ſo much Uſe in ſuch Caſes; though it be certainly true, that all ſtrong ſtimulating Purgatives are very hurtful and improper.

2. There were no *Ructus's*, or *Flatus's* upwards or downwards, nor *Borborygmi*, notwithſtanding this Diſtenſion of the Belly and Inflation of the Guts.

This, I think, ſhews very plainly, that the Guts had loſt all Motion, and were Paralytic by the total Want of *Bile* only, as much as if their Nerves had been totally obſtructed: For had any Motion remained in them, whether the natural and regular periſtaltic Motion, or a preternatural convulſive one, the Contraction of them either way, would have propelled the contained Air from one Place to another, and would have occaſioned *Borborygmi*, or would have expelled a Part of it upwards or downwards, when Nature had ſo much need of it to relieve the diſtended Guts, and Art had contributed to that Intention by Clyſters and Purgatives given. Which ſerves to illuſtrate what has been ſaid above, concerning the defective and convulſive Motion of the Guts in Hyſteric Caſes, where, through a Defect in the Quantity or Quality of the *Bile*, or from both theſe, the Motion of the Guts becomes defective, irregular or convulſive, but is not totally loſt through a total Want of it, as in this Caſe.

3. He never went to Stool after he received the Wound; and the ſtrongeſt Purgatives and Clyſters that could be reaſonably given, had no Effect.

This ſeems alſo to be owing to the Want, or total Loſs of the periſtaltic Motion; and plainly ſhews, that the ſtrongeſt purging *Stimulus*, has not the Power to reſtore it, without the Aſſiſtance of the Gall: For, had it been in any Degree reſtored, the Belly would have fallen proportionally, and ſome Evacuation of what was lodged in the *Primæ Viæ* would have followed. If then the Power of Purgatives depends upon the Co-operation of the *Bile*, it will follow, that where it is moſt active or redundant, their Operation will be, *cæteris paribus*, greateſt; and where it is unactive or deficient in Quantity, they will have proportionally a leſs Effect. Though it be true, that a Quantity, or morbid Acrimony of the *Bile*, by a too ſtrong and violent Irritation, will bring the *Inteſtines* into ſuch Spaſms, as to ſtop all Excretion by Stool; and the ſtrongeſt purging *Stimulus* added to it, does only increaſe the Spaſms and Coſtiveneſs; as in *Bilious* Cholics, which are always attended with exceeding Coſtiveneſs, not conquerable

querable by the ſtrongeſt Purgatives, if they be not joined with Opiats, to allay the Spaſms, and obtund the Acrimony of the *Bile*. He took what was thought a ſufficient Quantity of liquid Food and Drink; but if the Elater of the Guts, and their periſtaltic Motion were loſt, it is eaſy to prove that none of his Food or Drink could enter the *Lacteals* for want of the periſtaltic Motion; and therefore that he died ſtarved. All that have ſeen live Diſſections, intended to ſhew the Nature of the periſtaltic Motion, and the Courſe of the *Lacteals*, muſt have obſerved, that the Guts have an alternate Syſtole and Diaſtole, or Contraction and Dilatation called the periſtaltic Motion, the ſuperior Section contracting itſelf, while the immediate Inferior is dilated; and this Motion is carried on in ſeveral Parts of the Guts at the ſame time; and the contracting Part, by expelling the Blood and Chyle out of it's Sides, in it's Contraction, looks pale, while the Parts dilated look florid, and the Veſſels full of Blood and Chyle.

Now the Part contracting muſt neceſſarily force the Chyle from the groſſer Parts of the Food or Aliments, towards the inner Surface of the Guts, where the perforated capillary Extremities of the *Lacteals* in the *villous Coat* are ready to admit, or rather to abſorb, it by Attraction, as far as the larger and viſible Branches of the *Lacteals* on the Coats of the Guts, into which it eaſily flows in the time of Dilatation, or Diaſtole, which expands and unfolds theſe Veſſels at that time for it's eaſy Reception; from which it is farther propelled by the next Syſtole, or Contraction, into the primary or firſt Order of the *Lacteals* in the *Meſentery*; and by the ſame repeated Impulſes of the contracting Sections of the Guts, is forced farther thro' the ſecond Order of *Lacteals* in the *Meſentery*, into the *Receptaculum Commune*, and the *Thoracic Duct*; aſſiſted by Valves, and promoted by the inceſſant Motion of the Muſcles, and of all the Contents of the *Abdomen* and *Thorax* in Reſpiration, it is at laſt poured into the *ſubclavian Vein*, for a perpetual Recruit of the Blood in a healthy State. But if the muſcular Fibres of the Guts have loſt their periſtaltic Motion, as in this Caſe, then the Expreſſion, Abſorption, and Progreſs of the Chyle deſcribed, cannot ſucceed, the Blood muſt be deprived of it's Recruit, and the Perſon die ſtarved; which ſeems to have been this Perſon's Caſe, and will ſufficiently account for the reſt of the Symptoms above recited. 1*ſt*, His want of Sleep, and the Inability of *Opium* to procure it, might be owing to a want of Recruit of Chyle in the Blood: As we ſee that thoſe who live ſparingly, ſleep very little; and thoſe who feed plentifully, require by ſo much a greater Number of Hours to ſleep; and in all chronical Caſes, where the Body ceaſeth to be nouriſhed, the Sleep alſo fails, and *Opiats* have but little Power; whereas in Children, where a great part of their Food goes towards both Nouriſhment and Accretion, the greater part of their time is ſpent in Sleep. It may indeed ſeem difficult

cult to conceive how a want of Reſt ſhould enſue ſo ſoon after the Accident. But conſidering that the Loſs of one Meal in a Day, eſpecially of Supper, to ſuch as have been accuſtomed to ſup; has occaſioned fewer Hours Reſt in the following Night, it will follow, that ſuch Perſons require at leaſt ſome ſmall Recruit once in ſix or ſeven Hours, in order to reſt their uſual Number of Hours; and therefore in our Caſe, where all Recruit muſt have ceaſed ſoon after the Accident, he might be ſenſible of the Impairment of Reſt in ſix or ſeven Hours after it, and thoſe about him might well obſerve the Increaſe of that Symptom, at leaſt in the following Night. Another Difficulty ariſeth from the Obſervation of *Swallows*, *Tortoiſes*, *&c.* who ſleep moſt in Winter, when they eat and drink nothing. In anſwer to which, there ſeems to be no Parity between the natural Conſtitution of their Blood and Humours, and that of Men: To theſe, and ſuch like Animals, with regard to Recruit and Nouriſhment, Action and Reſt, the Spring and Summer are as one Day, and the Winter as one Night, and their Blood and Humours ſeem to be fitted, not only to bear, but even to require ſuch long Periods of Reſt and Action. And probably there is as little Parity between the Craſis and Conſtitution of the Blood and Humours of a healthy Perſon, and of thoſe in ſoporous and cataleptic Diſeaſes, who are reported to have ſlept for Weeks or Months without Food of any kind: And therefore, I ſay, where the Craſis and Conſiſtence of the Blood and Spirits are nearly the ſame, that is, *cæteris paribus*, he who feeds and is nouriſhed moſt, will ſleep longeſt, *& è contra.* The Poſition here advanced is farther confirmed by the Inefficacy of the Opiats given, they being capable of entering into the Blood thro' the Pores of the Stomach in Contact with them; by which quick Paſſage they have been obſerved to procure Reſt ſoon after they have been applied outwardly, or taken down into the Stomach, as in this Caſe they may juſtly be ſuppoſed to have done: Tho' for the Reaſons above-mentioned, neither they nor any thing elſe could paſs by the *Lacteals:* But as the Aliments could not paſs that way, *viz.* by the Pores of the Stomach, nor by the Lacteals into the Blood, there could be no Recruit nor Nouriſhment: And therefore the Opiats, tho' they did enter into the Blood by the Pores of the Stomach in contact with them, could not procure Reſt. Thus it would ſeem probable, that Opiats do produce their Effect by detaining the Chyle crude longer than uſual in the Maſs of Blood, and thereby lengthen Sleep beyond the uſual Time; and that they are ineffectual where is no Chyle in the Blood to be detained. But their Power of retarding or ſuppreſſing all or moſt of the Secretions and Excretions; their palling or obtunding the Appetite; their enabling one to faſt long, and ſupporting one in Journies and Labour for a long time without Food (Effects well known to the *Turks* and *Aſiatics* in their Journies thro' Deſerts, *&c.*) Theſe, and ſome other known Effects

Effects of Opium, very much favour this Opinion. 2*dly*, The want of Pus in the Wound was probably owing to a want of Recruit of Chyle in the Blood; and the Flabbineſs and Paleneſs of it's Lips, to a ſhrinking of the Parts for want of daily Nouriſhment. 3*dly*, The ſmall Quantity of Urine was probably owing to a want of Recruit of Fluids from the *Primæ Viæ:* For theſe, in a healthy State, find their way to the Urinary Paſſages very ſoon. The ſlight Tincture of Yellow, which it had, muſt have been from the Bile ſpilt in the *Abdomen*, and filtrated thro' the Duplicature of the *Peritonæum*, and bottom of the Bladder: For it could not be ſuppoſed to derive it's Colour from the Blood, into which no *Bile* could now enter by the common Way. 4*thly*, The Want of *Saliva*, and the ſilky Drineſs of the Tongue, ſeems to have been owing to the ſame Cauſe, a Want of Recruit of Fluids in the Blood, and a Loſs of ſo much of them as fell into the Abdomen. 5*thly*, If it be ſuppoſed that ſuch a ſmall Wound thro' the Integuments and Muſcles of the *Abdomen* and the *Peritonæum*, was capable of producing a Fever, then his not having any Symptoms of a Fever, muſt be owing to a total Defect of Bile and Chyle in the Blood, none of which could enter the Lacteals for want of the periſtaltic Motion, as has been ſaid. *Laſtly*, The few Fits of Hickup, Reachings to vomit, and Intermiſſions in the Pulſe in declining and dying Perſons, ſeem to ariſe not only from a Defect, and therefore an unequal Diſtribution of the Blood and Spirits, but chiefly from the Corruption and irritating Acrimony of them, as the immediate Cauſe of Death in this and moſt other Caſes. Which will be farther explained in the following Pages.

Objection I. It may very reaſonably be objected here, that the *Ductus Hepaticus* would carry a Sufficiency of *Bile*, for the Uſes of the animal Œconomy, into the Cavity of the Inteſtines, tho' none came by the *Ductus Cyſticus*; and Nature ſeems to have provided the *Ductus Hepaticus* for this Purpoſe, that if any Obſtruction or Defect ſhould happen in any of theſe Secretory Channels, the Secretion and Excretion might go on for the Benefit of the Œconomy, in the other: As Nature has provided two Kidneys, and double Organs of Senſe, for the ſame Reaſon. But the Effect will not be the ſame in a Wound, which is the Reverſe of an Obſtruction; becauſe by a perpetual Evacuation thro' it, ſuch a Revulſion and Derivation is made, as drains and deſiccates all the neighbouring Parts, and either leſſens or entirely fruſtrates the Secretion and Excretion by them: And this we find to be true, where the Secretory Organs and Ducts concerned in the different Secretions, lie at a great Diſtance from one another; as in the *Diabetes* we generally ſee a very great Deſiccation of the *Salival Glands*, a Defect of *Saliva*, and a perpetual Thirſt; and Sweating and Looſeneſs leſſen the Secretion by Urine; an *Iſſue* drains and emaciates the neighbouring Parts; and it is mechanically demonſtrated by *Bellini*, that the Flux of Blood, and of all the Humours, will

will be most and strongest towards the Part where the Resistance is taken off; as in Bleeding; to which this perpetual Flux of Bile, thro' the wounded *Gall-Bladder*, seems to have a great Affinity; and therefore would probably promote the Afflux of Blood and Secretion of the Bile so much and so strongly towards the *Vessels*, *Glands*, and *Secretory Ducts* leading to the *Cystis*, as very much to lessen, or totally to hinder, the Secretion by the *Ductus Hepaticus* into the Guts by that Channel.

Another Objection is, that as the Guts and other Contents, and even the Muscles and Integuments of the lower Belly, were highly tinged by the Bile, it is probable that some of it has got into the Cavity of the Guts, where it might by it's *Stimulus*, keep up the peristaltic Motion, and by the *Lacteals* get into the Blood, as some of it got into the Bladder in that manner, and tinged the Urine. It is not unlikely that this might happen when the Bile came to be very redundant in the Cavity; but in passing thro' the Interstices of the Vessels and Fibres of the Guts, as thro' a *Filtre*, the grosser, saline, and sulphureous Particles of it, which are the most pungent and active Parts, must have been left behind; which the muddy Thickness as well as Deepness of the Colour of the Liquor found in the Cavity of the *Abdomen*, compared with the transparent Clearness of the *Urine* of a much lighter yellow Colour, without Sediment, does seem to prove: And it is not likely that such a small Quantity of filtrated Bile, as may be supposed to have passed that way, deprived of all it's active Particles, could either in Quantity or Quality be sufficient to assist in any Function of the Animal Œconomy: And, in Fact, if any passed that way, it appeared plainly insufficient to promote the Contraction and peristaltic Motion of the Guts, which remained preternaturally distended, from the Beginning to the Time of his Death. *Objection* II.

It has also been objected, that an Animal which dies starved, dies delirious and feverish; the Experiment having been made on Cats and Dogs: And therefore this Person, who had no Fever, nor Delirium of any kind, cannot be supposed to have died starved. I will not dispute these Facts, especially the Experiments upon Cats and Dogs, tho' I have not made any myself, nor do I remember to have had any just or accurate Account of the Symptoms of such who have died of Hunger and Thirst, in Sieges, and at Sea; tho' many Instances have been, and no Notice, that I know of, has been taken of their having died mad, delirious or feverish, tho' these Symptoms are so remarkable and affecting. But supposing these Facts, these Cases will differ very much from this before us: For an Animal starved to Death purely for want of Food, has the Gall flowing continually into the Cavity of the *Intestines*, unmixed and undiluted with Chyle, and from thence by the *Lacteals* into the Blood; so that in a few Days this acrimonious Juice must become more redundant there, than any other Humour; which joined with the constant Attri- *Objection* III.

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tion of the Globules in Circulation, muſt ſoon render the Blood very acrimonious, rancid, and alcalin; that is, muſt reduce the whole to a Maſs of Putrefaction, capable of ſtimulating the Brain and Nerves, ſo as to produce a Fever, Delirium or Madneſs: But in the Caſe under conſideration, no Gall could enter into the Blood: And therefore this Degree of Putrefaction, and the Effects of it, could not happen; tho' it muſt be owned, that, thro' a Want of Recruit and Dilution, a lower Degree of Putrefaction of the Blood and Humours muſt have followed, even in this Caſe, from the continual Attrition in Circulation; ſuch at leaſt as was ſufficient to render the whole Maſs in a few Days unfit for any of the Uſes in the Animal Œconomy; and therefore may be juſtly ſuppoſed to have been the immediate Cauſe of Death: For all the paſſive Principles or Materials of Putrefaction, being actually in the Subſtance of the Blood, and all the active Principles of Heat and Attrition being at work upon it to produce this Effect, it could not fail to be brought about in a few Days; and the ſame would happen to all Animals, if what is effete, corrupted or altered, ſo as to be unfit for the Uſe of the Animal, was not continually carried off by the *Emunctories*, and a freſh Recruit daily ſupplied from the *Primæ Viæ*; which Evacuations and Supply being kept up in their due Quantity and Proportion, do effectually prevent all Putrefaction and Acrimony, and keep the Blood and Humours in their natural Temperature. It is not then a Defect in the Quantity of Fluids which kills an Animal in faſting, but a poiſonous Acrimony, which the Blood and Humours naturally contract, for want of a freſh Recruit and equal Evacuation. Thus in chronical Diſtempers, where the Perſon appears extenuated and exhauſted, the Quantity of the Fluids is certainly very ſmall, yet enough to maintain Life for ſome Months or Years, being kept in ſome degree of Sweetneſs or proper Temperature, by a certain Proportion of Recruit and Evacuation: But where the Recruit is entirely ſubſtracted, the Evacuations will be proportionably leſſened: And therefore the Quantity of Fluids may remain much the ſame, but the Quality will alter, and Putrefaction, for the Reaſons above-ſigned, muſt take place, and be the immediate Cauſe of Death, even long before the Maſs of Fluids can be much diminiſhed in quantity, as in the Caſe before us. Which leads to the Anſwer of another Difficulty, *viz.*

Objection IV. How the *Pulſe* ſhould continue full, ſtrong and equal for ſeveral Days, while the Perſon was in a ſtarving Condition, and the Blood had no Recruit from the *Primæ Viæ*. This indeed would be very unaccountable, if the Waſte of the Blood and Humours were ſuppoſed to continue at the ſame Height as before the Accident, and the Evacuations by the *Emunctories* were the ſame as in perfect Health. In this manner the Contents of the Blood-Veſſels would be ſoon waſted and exhauſted: But *Sanctorius*'s Obſervations and Experiments ſhew, that the daily Recruits and Evacuations keep pace with one another, and are nearly equal in 24 Hours in a healthy State: And therefore

where

where the Recruits are plentiful, the Evacuations will be equally ſo; and where thoſe are ſparing, the Evacuations are ſmall; or where the Balance is caſt too much on either ſide, ſome Indiſpoſition or Diſtemper muſt follow. There is no Exception from this Rule, but in Children, a part of whoſe Nouriſhment goes to Accretion: Therefore in the Caſe before us, the Recruit being entirely ſubſtracted, the Evacuations muſt have been little, or next to nothing: And therefore the Quantity of the Blood and circulating Humours would remain much the ſame, and keep up the Fulneſs, Strength and Equality of the *Pulſe* for ſeveral Days, until the *critical Putrefaction* and *Colliquation* of the Blood above-mentioned, on the fifth or ſixth Day, rendered it unfit for a regular Circulation, and produced Intermiſſions in the Pulſe, reachings to vomit, and Hickup, all of them being local Convulſions, and the Effects of Corruption, Acrimony, Irritation, and an unequal Diſtribution of the Fluids, which terminated in Death the Beginning of the ſeventh Day.

The Sum of what has been ſaid is, that in this Caſe, very little, if any, Bile entered into the *Inteſtines*, and that ineffectual; and none at all into the Blood. And as there was no apparent Defect in any Part of the Body, nor any Wound that could have been either dangerous or deadly, in any other reſpect than as it gave Occaſion to the Loſs and miſplacing of the Gall; it is therefore evident, that all the Symptoms, and his Death, were entirely owing to the Loſs of this uſeful Juice; which it ſeems is ſo neceſſary to all Parts of the Animal Œconomy, that this Perſon could not live above ſix Days without it.

The practical Inferences that ſeem to flow by neceſſary Conſequences from this Obſervation, are, 1. That the periſtaltic Motion of the Inteſtines is as much owing to the Influx of the Bile into their Cavity, as to the Influx of the animal Spirits and Blood into their Sides: And therefore that the Bile is to be looked upon as one of the prime Movers in the Animal Œconomy, by which the elaſtic Springs of the natural Motions, to wit, the muſcular Fibres of the Guts are ſet to work; upon whoſe Motion all the ſubſequent vital and animal Motions do ſo far depend, that none of them can be long in perfection where it is imperfect, nor ſubſiſt many Days where it is totally wanting. 2. This prime Motion is totally loſt by a total Want of Bile; proves ſluggiſh by a Defect in it's Quantity; becomes irregular or convulſive by a great Redundancy or morbid Acrimony of it. From whence ſeveral Diſtempers that are called Nervous may ariſe, and are more likely to be cured by correcting and evacuating the redundant or faulty Bile, and diſobſtructing the Liver, than by moſt Medicines taken from the common Claſs of *Nervines*. 3. That the Power of Purgatives depends upon the Co-operation of the Bile: And therefore it is probable, that the Difference of Conſtitutions, at equal Ages, with reſpect to Purgatives, depends more upon the Quantity

and Quality of the Bile, than on the Bulk or Weight of the Body, Quantity of the Blood, or other circulating Humours. 4. It alſo appears, that the Nouriſhment and Accretion of the Body do in ſome meaſure depend upon a due Quantity and proper Quality of this Juice, without which the Blood and circulating Humour could not be recruited from the *Primæ Viæ*: And therefore that Defects in it may be frequently the Cauſe of a *Maraſmus*, or Waſte of the Body, where it is little ſuſpected: Which may ſerve to point out the Method of Cure in ſuch Caſes. 5. This Obſervation ſeems to lead to the Knowledge of the immediate Cauſe of natural Reſt or Sleep in a healthy State; to wit, a certain Quantity or Proportion of freſh Chyle in the Blood; the Want of which, from whatever Cauſe, will occaſion Watchfulneſs, or ſome degree of it. And this may ſerve to point out the immediate Effect and Conſequences of Opiats, whence may be gathered how far, and in what Caſes they may be effectual and uſeful; and in what Circumſtances they may be ineffectual, uſeleſs or hurtful. 6. That a due Quantity of Aliments, at proper intervals of Time, is neceſſary to keep the Blood and Humours in their natural Temperature and Sweetneſs, and to preſerve them from Acrimony and Putrefaction: And this will be true in all Diſtempers as well as in Health, and is againſt the Practice of ſuch as pretend to ſtarve away Diſtempers, or to deny a due Quantity of Drink and liquid Food to the Sick, eſpecially in Fevers, where the want of this Recruit will tend to increaſe the Acrimony or Putrefaction, whence the Malignity of moſt Fevers ariſes. 7. That Pus, or Matter, in a Wound or Ulcer is the Product of Chyle, and not of the Blood or Serum: Which has indeed been the received Opinion, tho' ſupported by no other Proof than the Similitude from Pus to Chyle. And as a great Redundancy, as well as a Defect of Pus, does ſometimes retard the Cure of a Wound or Ulcer, this may ſerve to ſhew by what Means it may be increaſed or diminiſhed, to anſwer the Intenſions of the Artiſt. This alſo makes it appear probable, that a great Redundancy of Chyle diſpoſeth the Body to purulent, ſuppuratory and ſcrophulous Diſtempers; and ſeems to indicate the ſubſtracting ſuch ſorts of Food as afford a rich, groſs or plentiful Chyle, and the adminiſtring of ſuch Medicines as may ſtrengthen Sanguification, and the other aſſimulating Powers, to aſſimulate and thereby conſume it; the Sanguification and aſſimulating Powers being manifeſtly weak, as the Chylification ſeems to be ſtrong in all ſuch Caſes. And this ſeems to be the Reaſon why in Adults, as the Sanguification grows ſtronger, and in Age, as the Voraciouſneſs of the Appetite, too common in Youth, declines, theſe Diſtempers do often decreaſe, and at laſt wear out of themſelves: Which ſhews what Aſſiſtances Art ought to contribute, to bring about the ſame Effect in a leſs Time.

I muſt

I muſt here own my Omiſſion to open the Stomach and Guts, in order to view the State of their Contents, where the Gall was entirely wanting, which might have given ſome Light to this Obſervation. This Omiſſion happened thro' ſome Hurry at the Time, which I regret; but am apt to believe, that as moſt of his Aliments were Liquids, the Alterations would not have been very conſpicous.

Spittle of an unuſual Colour, by John Huxham, *M. D.* N°. 382. p. 63.

VI. D. *Fox*, quadragenarius, gracilis, bilioſus, per menſem unum alterumve elanguerat, nauſea, ictero & doloribus colicis vexatus, tandem ex epoto largiter vino pomaceo vehementiſſimo colices paroxyſmo correptus me conſulit, vomitabat omnia, urinae parum reddebat coloris lixivii, quae ſedimenti plurimum deponebat ſubviridis. Ego ſtatim illi potionem ex Ipecac. emeticam propinari jubeo, infuſo dein C. Bened. affatim hauſto plurima viſcoſa, bilioſa, rejecit: tum enemate Terebinth. injecto alvus bis terve reſpondit. Ex ſumpta miſtura anodyna vomitus & tormina comprimuntur; jam de languore ſummo & abdominis diſtentione conqueſtio; paulo etiam poſt recrudeſcit dolor. Bolum praeſcripſi ex Jalap. ℈j. Calomelan. gr. viij. Spec. Diambr. gr. vj. Laud. ſolid. gr. j. Syrup. de Sp. Cerv. q. ſ. quam primum ſumend. cum Tinc. ſacr. ʒij. Hinc omnia pacata, poſt horas 12 ter fundit alvus perliquida, bilioſa. Ex ſumpto dein hauſtu anodyno nox tranquilla. Mane de dolore & faucium tumore queribundus craſſa, ſubfuſca, expuebat; mox abunde effluit ſaliva colore viridiſſima, bili porraceae quam ſimillima, niſi quod tenuior. Perduravit fluxus hic ſalivae viridis horas quaſi 40, quo tempore ſputavit quantum vix caperent ſextarii duo: ad flavedinem dein vergebat color fluoris eo uſque dum ad inſtar ſolutionis Gut. Gambae evaſit: quantitas autem aucta potius quam diminuta. Perſtitit & hicce color per horas etiam 40, dein ſenſim pellucida facta eſt ſaliva, atque ſubito, uti oborta eſt, evanuit penitus ſalivatio. Intra biennii ſpatium bis terve in icterum inciderat ante hujus morbi acceſſionem. Decem abhinc annis maxima ſalivatio ſponte erumpens hunc ipſum hominem in ſummum vitae diſcrimen intulerat; ſalvus autem evaſit ope doctiſſimi expertiſſimique Medici, D. D. *Pyne*. Tunc vero temporis ne vel ☿ii hilum ſumpſerat, nec ullo modo fuerat colorata ſaliva.

In hac hiſtoria obſervatu haud indigna quaedam occurrunt. Salivatio nempe ſponte exuſcitans, vel ex tantillo forſan Calomel. excitata. Calomel. autem probe paratum novi, quippe qui plurimas ejuſdemet doſes, quarum aliquas ad ſcrupul. integrum, exhiberi juſſeram, ne vel minimo ſequente ſalivationis ſigno. Occurrit porro, quantum ego ſaltem ſcio, ſalivae inauditus color. Saliva viridi ita penitus tincti erant dentes & fauces quaſi aerugine obducti fuiſſent: permanſit dentium color viridis 14 poſt diebus quam convaluit. Notandum praeterea fluxum hunc ſalivae fuiſſe criticum, quo judicatus eſt & icterus & colicus morbus; ab inceptante enim ſalivatione ne vel minimus dolor ventris, & color cutis ſubviridis ſenſim evanuit, uri-

nam etiam reddidit copioſius; ſed ſubnigram. Ille vero, qui ante hunc fluxum valde languidus fuit & jam quaſi moribundus maximum ſalivae evacuationem εὐρέῳς φέρε. Serum Ictericorum tinctum eſſe bile omnibus notum eſt: nec alicui forſitan videatur magis mirandum, ſerum flavum poſſe per glandulas ſalivares excerni quam per ſeroſa cutis vaſcula, quod tamen ictero laborantibus contigiſſe ſaepius obſervavimus, admoto prius epiſpaſtico: de urina bilioſa nil dicam. Unde vero color ſalivae viridis haud ita facile dictu. Hujus opinor ego cauſam procatarticam eſſe pomacei vini potationem. Bili ſi miſcueris acidum color oritur viridis. Hinc torminoſae infantum dejectiones virides, lacte in ventriculo aſceſcente. Hinc porracea bilis. Ponamus jam acidum pomaceum à venis lacteis vel & à meſaraicis forſan, abſorptum, ſeroque ſanguinis bilioſo permixtum: quid eveniret inde? Credo equidem flavi ſeri coloris in viridem permutatio. Profiteor hercle, acida quaecumque à vi corporis vitali in alcalinam naturam mutantur, etiam ipſum vitrioli acidum: langueſcentibus autem viribus, concoctione laeſa, lympha effoeta facta, facta & inerte bile, queis adde ſanguinem tardius circulantem, acida parum ſubacta, nec in primis viis, nec in ipſo ſanguine, acidam exuunt naturam. Hoc teſtantur acidi debilium ſudores, aciduſque in ore ſapor à febribus inflammatoriis convaleſcentium, quibus ad reſtinguendam febrem largius fuerat exhibitus acidus potus. Saepius certe memini me vinum pomaceum largiter potâſſe brevique urinam ipſiſſimum potus odorem ſpirantem reddidiſſe. Curabam nuperrime mulierem ſumma haemorrhagia, durante diu, correptam, cui inter caetera plurimum fuerat exhibitum Elix. Vitriol. Mynſich. ceſſavit tandem haemorrhagia, debilis autem inde reddita mulier incidit in leves ſpaſmos, artuumque dolores, ventris tormina diarrhoea comitante, plures excrevit alvus dejectiones viridiſſimas, ſtercoris vaccini ſimillimas, taleſque per plures dies, quanquam Rhabarb. fuerat ter exhibitum ad expurgandas acidi particulas, inteſtinis adhaerentes. Hic ſal acidus ſanguini immiſtus, poſt dies plures iterum è ſanguine per inteſtina rejectus eſt, vi vitae nullo fere modo ſubactus. Microſcopio olim obſervavit *Leeuwenhoekius*, quod chyli ſales acidi à bile retundantur & comminuantur, quum vero in jecore ſubſiſtat obſtructa bilis, integris viribus vaſa lactea permeat acidum. In aegroto autem noſtro bilem obſtructam fuiſſe, patuit inde, quod alvus fuerat compreſſior, & foeces ante vomitum medicamento commotum reddidit albidas. Hypotheſis fortaſſe noſtra illuſtretur magis, ſi perpendamus unde oriatur virginum κακεκτῶν color herbeus. His enim fructus immaturi, acetum atque id genus alia, ſummae ſunt cupidiae, vitiatis autem concoctionis organis, parum immutata ſanguini miſcentur, bilemque & ſanguinem obruunt acido. Hinc glandulae obſtructae, hinc facies ex viridi pallida, tumor hinc hydropicus; atque quod non levis eſt momenti jecur ſchirroſum ex chloroſi praemortuarum ſaepe inventum fuit viride. Jam paucis reſtat dicendum unde colori ſalivae viridi ſucceſſit color

flavus,

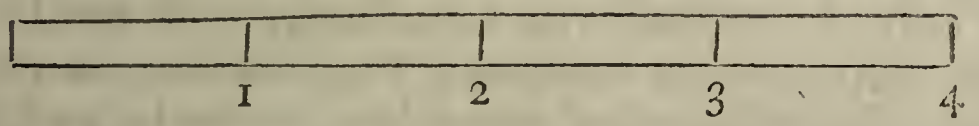
flavus, quod inde factum arbitror, quia poſt acidum à ſanguine partim ablegatum, partim & à motu ſanguinis, ob cardiaca exhibita, aucto deſtructum, ſuperfuit ſolum ſuperflua bilis ſanguine expellenda, quod & brevi feceſſit, reſeratis bilis poris, & per patulos ſalivae ductus mirandum in modum excreta.

Experiments to prove the Exiſtence of a Fluid in the Nerves; by Alex. Stuart, *M. D. F. R. S.* N°. 424. p. 327.

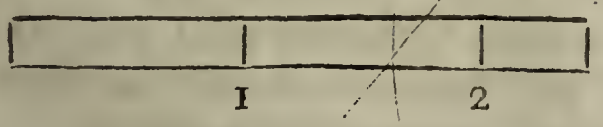
VII. *Exper.* 1. I ſuſpended a Frog by the Fore-legs in a Frame, leaving the inferiour Parts looſe; then the Head being cut off with a pair of Sciſſars, I made a ſlight Puſh perpendicularly downwards, upon the uppermoſt Extremity of the *Medulla Spinalis*, in the upper *Vertebra*, with the Button-end of the Probe, filed flat and ſmooth for that purpoſe; by which all the inferiour Parts were inſtantaneouſly brought into the fulleſt and ſtrongeſt Contraction; and this I repeated ſeveral times, on the ſame Frog, with equal Succeſs; intermitting a few Seconds of Time between the Puſhes; which, if repeated too quick, made the Contractions much ſlighter.

Exper. II. With the ſame flat Button-end of the Probe, I puſhed ſlightly towards the Brain in the Head, upon that End of the *Medulla Oblongata* appearing in the occipital Hole of the Skull; upon which the Eyes were convulſed. This alſo I repeated ſeveral times, on the ſame Head, with the ſame effect.

Exper. III. I tied a piece of fine Twine, or Thread, parallel to the crural Artery, Vein and Nerve of a Dog, and made a Ligature on them, and on the parallel Twine, above and below, at the Diſtance of about 4 Inches; then I cut beyond the Ligatures above and below, ſo as to take out the Veſſels and Nerve, together with the parallel Twine, in one Bundle; and laying them on a Board, both the Artery and Vein contracted immediately, and were ſhortned to almoſt one half of the natural Length which they had in the Body; to wit, to two Inches and a half: whereas the Nerve remained uncontracted, at it's natural Length, and commenſurated to the parallel Twine of four Inches, as before it was cut out of the Body, according to the annexed Figure.



The Nerve and Twine at their natural Length.



The Artery and Vein contracted.

By which it appears that the Proportion of the Blood-Veſſels in their compleateſt Contraction, to themſelves in a State of Extenſion, and to the Nerves at their conſtant and natural Length, is nearly as

5 to

5 to 8 ; or, which is the ſame thing, any given Section of a Blood-veſſel, cut out and left to itſelf, is capable of contracting, ſo as to loſe $\frac{3}{8}$ Parts of it's Length. But tho' this Experiment may ſuffice for eſtimating the Elaſticity of the Blood-veſſels in general, yet it is not to be doubted, but the Degree of their Strength and Elaſticity may differ a little more or leſs in Animals of different Species, and Individuals of the ſame Species, nay even in the ſame Individual at different Stages of Life ; but theſe Differences are not material to my preſent Purpoſe, which is only to ſhew, that the Nerves are not elaſtic, and that the Blood-veſſels are ſo to a very conſiderable degree.

Inferences from theſe Experiments.

The two firſt Experiments ſhew, that the Brain and Nerves contribute to muſcular Motion, and that to a very high degree. The third Experiment makes it as plain, that what they contribute in muſcular Motion, cannot ariſe from, or be owing to Elaſticity, which they have not. What remains therefore but to conclude, that the Action of the Nerves in muſcular Motion, is owing to the Fluid they contain, by whatever Name we may chuſe to call it. To fortify this Concluſion, let us conſider, that we can have no other Evidence of the Exiſtence of that inviſible Fluid the Air, and of it's ſeveral Qualities of Elaſticity and Gravity, but what ariſes from Experiments and Obſervations of it's Effects ; which are ſufficiently ſatisfactory, and convince us of it's Exiſtence, tho' the minute Particles of it's Compoſition fall under none of our Senſes. Therefore, in the ſame manner, ſeeing theſe Experiments put the Elaſticity and elaſtic Vibrations of the Nerves quite out of the Queſtion, I think we may as fairly conclude, that there is a Fluid in the Nerves, tho' inviſible ; as that there is ſuch a Fluid called the Air, tho' it cannot be ſeen. I ſhall only add, that tho' we may call this nervous Fluid by any Name, to which a proper, determined and fixed Idea is annexed, yet I think the Word (*Spirits*) was an unhappy Choice, as it includes an Idea either of ſomething like to the Spirits of fermented Liquors, or ſome of the ſaline volatile Spirits, as that of Hart's-horn, *&c.* or a flying Vapour or Exhalation, all which being looſe and indetermined, have ſerved only to miſlead the Inquiſitive, and amuſe the Ignorant. But the Source from which this Fluid ariſeth, to wit, the circulating Blood ; the Veſſels thro' which it is ſecerned ; and the Nerves in which it moves and is contained ; the ſoft and almoſt inſipid Taſte, and no Smell obſervable in the Brain and Nerves, ſuggeſt no Idea of ſuch Spirits : And the ſimple Qualities of a pure and perfectly defecated elementary Water, will better ſuit all that our Senſes can diſcover of it, and are indeed ſufficient to ſolve all the *Phænomena* of the Animal Œconomy, as far as they depend upon the Nerves.

The Operation of Medicines ; by Dr John Quincy, N°. 365. p. 71.

VIII. I ſuppoſe. 1. That all thoſe Parts of an Animal Body, which are vaſcular, or thro' which any Fluid paſſeth, from the Inteſtines to the minuteſt Fibre, are the Seat of the Medicine's Operation. 2. That this whole Courſe of Circulation, or Animal Motion is naturally

rally distinguished into 3 different Stages, by the different Capacities of the Vessels and Motions of their Contents, each having it's proper Out-let; and that these are the Seat of the 3 Concoctions, so often mentioned by Physical Writers: The first in the Stomach and Bowels, having the *Anus* for it's Emunctory; the second, all within the Blood's Motion, so far as it retains it's Colour, having the Kidneys; and the third, all beyond that Circuit, having the Skin for an excretory Organ. 3. That every Medicine which causeth Evacuation is a Purge. 4. That every Purge operates as a Dissolvent, by fusing the Juices and increasing the Quantity fit for Expulsion; or as a *Stimulus*, by accelerating their Motions, so as to bring the Matter fit for Expulsion, oftener to the secretory Out-let, or both. These Assumptions, which, I expect, will not be disputed, are premised only for the better Proof of this grand Proposition. That a Change in the Bulks, Figures, and Motions of the component Particles of a purging Medicine, will change the Seat of it's Operation, and fit it for Exertion in larger or lesser Vessels as those mechanical Affections are intended or remitted.

For Illustration hereof, it may be convenient to attend the Management of common Practice, in making a Purge operate more or less, than it otherwise would do. Substances which are gross and heavy, as those consisting chiefly of saline and earthly Particles, such as Tartar, Manna, *&c.* if they are reduced smaller by Triture, or repeated Solutions, operate more gently; but if acuated by Acids, or any Management which exposeth their Angles more sensibly to the Membranes, they are rougher, and take place sooner. Resinous Medicines, as Scammony, Gamboge, Jalap, and most of vegetable Production are more violent, and operate sooner, when they are more tenacious and adhesive, as in their Extracts, but gentler, when divided by hard brittle Substances, such as Salt of Tartar, Sugar, *&c.* Medicines which have in their Composition, Sulphur and Salt, are more or less rough, and speedy in their Operation, in proportion to their greater or lesser Participation of the saline Ingredient, and the Asperity of it's Angles: Of this kind are most Minerals, and their Preparations, and it may be sufficient to instance in the Management of Antimony and Mercury: The first of these is by by chymical Analysis known to be a Composition of a subtil Sulphur and Salt, and the more the saline Part is let loose by Preparation, and opening the Sulphur, as it is commonly termed, with the more Vehemence will this operate, and the sooner; whereas in it's lesser Preparations, when the Salts are closely wrapped up in their native Sulphur, they will hardly work at all till they are got into the fartheſt Stages of Circulation. *Mercury per se* is little known as a Medicine, and it's first Preparation, which makes it into Sublimate, so loads it with saline *Spicula*, that it amounts even to a Poison; but the more those *Spicula* are broke by Triture, Sublimation, *&c.* the milder it operates; and if to the Comminution of it's Points be added a Sulphur subtil enough,

enough to join it, it may be reduced to ſo mild a Medicine, as not to be felt, but in the laſt Stage of Operation.

This ſhort View may be ſufficient to ſhew, that it is exceſs of Aſperity, and Motion in a Medicine, that will not ſuffer it to paſs the Stomach, without irritating it into ſuch Convulſions, as will throw it up again by Vomit; that a farther Comminution, and ſmoothing it's Figure, will admit it into the Bowels, and make it operate by Stool; that a yet farther Remiſſion of it's Properties will carry it into the Blood, and allow it there to promote Evacuation by Urine; and that a yet farther Comminution will paſs it into the minuteſt Canals, where by the ſame Properties, only in a lower Degree, it will increaſe Perſpiration, or cauſe Sweat: ſo that the ſubtiler Medicines operate in the Capillaries, and ſmalleſt Fibres by the ſame Mechaniſm, that more groſs do in the common Stream of the Blood, when they go off by Urine, or the groſſeſt of all do in the greater Paſſages, when they promote Stool. Hence the Skill of preparing, and adminiſtring of Medicines conſiſt in proportioning it's manifeſt and known Properties, to the Capacity and Circumſtances of the Part it is to operate in, and to intend or remit it's mechanical Affections, as it is ſooner or later to take Place in the greater or leſſer Veſſels.

Of the firſt Claſs, there are few to be reduced ſmall enough to go beyond the greater Paſſages, and none of them are worth the Pains they require, to fit them farther than for Diuretics: beſides, their natural Fitneſs to attract, and join with the ſerous Part of the Blood, whenever they get into that Stage of Motion, runs them off by the Kidneys, before they can undergo Comminution enough to get farther; but if by frequent Repetitions of ſuch Medicines, and uncommon Laxity of the Paſſages, any Thing is paſſed into the Habit, their Groſſneſs fouls the delicate Strainers, which are left for their Expulſion; and they lodge upon the Glands and Capillaries in ſuch Manner, as induceth Intermittents, which is obſervable in many Perſons after the Uſe of Cream of Tartar, the common Cathartic Salts, and the Purging Waters, eſpecially at the latter End of the Summer, when the Heat of the preceding Seaſon hath debilitated the Solids, and left them under too great Relaxation.

Among the reſinous Purges, there are many very powerful ones, but where their Operation is deſired in the *Viſcera*, Blood, and remoter Parts, they muſt be extreamly divided, and this we find ſpirituous Menſtruums will do, by taking up the moſt ſubtile Parts only, and carrying them into very ſmall Paſſages, where their Operation is chiefly by Fuſion, becauſe the Softneſs of ſuch Subſtances cannot enable them in hardly any Degree to act as *Stimuli*, farther at leaſt than ordinary Detergents. And thus we find Aloes, the chief of this Tribe, to go farther into the Habit, and be longer e'er it operates, when managed in a ſpirituous Menſtruum as in the *Tinct. Sacra*. The *Rad. Turpeth.* and *Colocynth* likewiſe, with all of the vegetable Kind, that

will

will yield to a ſpirituous Liquor, are to be carried by that Means into the fartheſt Scenes of Animal Action, and there prove efficacious Medicines in Caſes, that with other Management they would never be able to reach: And on this Foot, it undoubtedly muſt have been, that we frequently meet with, in practical Writers, many of this Sort, mentioned as Alterants; *Colocynth* particularly by *Helmont*, for all Medicines, which operated in the fartheſt Paſſages, they commonly included under that general Appellation.

But the moſt efficacious Purges, and thoſe which require the moſt Skill, are from the Mineral Kingdom; theſe abound in Solidity, beyond any other Materials, and therefore, whereſoever they are brought into Action, excel in Quantity of Impulſe: Many of theſe therefore want not only the utmoſt Comminution to carry them into the farther Scenes of Operation, but alſo ſome Reſtraint to their Aſperities, and Motions, to fit them for many Intentions. Thus Sublimate, is not only to be much ſweetened, that is, ſmoothed in it's Points, to make it a ſafe Purge in the large Veſſels; but if it is intended to go farther than the Blood, and thoſe Glands, which in that Circuit, they are moſt apt to be lodged upon, when it ſalivates, it muſt be rendered not only very fine but covered with ſuch Subſtances, as weaken it's Points, and make it ſtrain into the laſt Subdiviſions of the Conſtitution. To this Purpoſe, the common Practice wiſely contrives in Diſtempers which lie fartheſt off, according to the Courſe of Circulation, to wrap up the Baſis of this Medicine, in Sulphurs, and ſuch like Subſtances, as follow it into it's laſt Diviſion, without giving it any Aſperities to make it act as a Stimulus. Thus for all cutaneous Foulneſſes, and habitual Taints, the Cinnabar, the Æthiops, and all of that Sortment are in Readineſs; and that ordinary Sulphurs will cover and deaden the efficacies of Mercurial Preparations, ſo that they ſhall not operate, but in ſuch Parts only, and in certain Circumſtances, is demonſtrable in ordinary Salivations, which are to be lowered at Pleaſure by ſulphureous Medicines. Medicines from ſuch Minerals where a Salt, and Sulphur are united by Nature, as they are in ſome Mercurials by Art, as in Antimony, the Native Cinnabar, Steel, *&c.* are manageable only upon the ſame Principles, and the more they are deſigned to be carried into the Habit, the more are they to be reſtrained by their natural, or adventitious Sulphurs: Steel, when opened by, and joined with, the Points of acid Liquors, operates ſooner, and will ſometimes prove even Emetic; but when it is covered with an additional Sulphur, it will go farther, and anſwer Intentions much more remote, as is manifeſt in the common Preparations of Steel, with Tartar, or Vinegar, and with Sulphur.

This Way of Thinking, on theſe Occaſions, ſeems to me alſo the more juſt, from conſidering the Texture of thoſe Subſtances, which by a natural Preparation are fitted for Operation in the minuteſt Part of an Animal Body, ſuch as thoſe of the Aromatic Kind, all which, more or leſs, according to their greater or leſſer degree of Subtilty,

and Smoothneſs, promote a *Diaphoreſis:* They conſiſt of exquiſitely fine Salts, covered with a moſt ſubtile Sulphur, as is demonſtrable by Chymical *Analyſis*; and the common *Sal Volatile Oleoſum* is an admirable Contrivance upon the ſame Foundation, where a very volatile Animal Salt is covered with a moſt exalted Vegetable Oil, whereby it is ſuited to paſs into the minuteſt Fibres, and make, as it were, a Part of the Animal Spirits themſelves. And here it may not be amiſs to obſerve, that all Animal Salts are very volatile or eaſily rendered ſo, but when bare, and naked, juſt as the fire draws them out, with a Mixture alſo of it's own Particles in their Compoſition, they are too pungent to be felt without painful Senſations, but when ſoftned with a fine Portion of an oppoſite Texture, which is ſmooth and yielding, they become moſt efficacious, and ſafe *Sudorifics*. On theſe Conſiderations, it likewiſe ceaſeth to be a Wonder why the ſubtile Salts of *Cantharides* are more ſenſibly injurious to the Bladder, than any other Parts, and why *Camphire* prevents thoſe Injuries, for the exquiſite ſmallneſs of thoſe *Spicula*, makes them imperceptible, but in the moſt minute Canals, into which the Fibres compoſing the Membranes of the Bladder are known to be divided; and Camphire blunts their Irritations, becauſe it's exquiſite Subtilty enables it to follow them into thoſe Meanders, and ſheath their Aſperities. To this purpoſe, it is very remarkable, what many (as I have been informed) now commonly practiſe, in guarding even Mercurials againſt their ſtimulating Properties, and ſending them into the fineſt Paſſages to operate by Fuſion, and the bare Force of Impulſe: For not only *Calomel*, and the *Mercurius Dulcis*, may be reſtrained from manifeſt Operation in the wider Paſſages, and the *Glands* about the Mouth, but even the Mineral Turbith, which of itſelf, in a ſmall Doſe, will operate powerfully by Vomit and Stool, when mixed with Camphire, will not be ſo much felt in thoſe reſpects, but go into the fartheſt Circuit of Motion, and promote the cutaneous Diſcharge in a more efficacious Manner, than any Medicine of leſs ſpecific Gravity. But in this Management, the Camphire is to be mixed but very little before taking, otherwiſe it hath not this Effect, which appears to be from it's great Volatility, which makes it in a great Meaſure exhale, while it ſtands mixed in a Medicine.

I am ſenſible of many good Purpoſes in Practice, that this *Theory* is applicable to, but becauſe the Limits I have ſet myſelf herein, will not ſuffer me to inlarge, I ſhall content myſelf with this only Inſtance of Camphire, which is enough to ſuggeſt to thoſe who turn their Thoughts this Way, in what Caſes, that, and ſuch Subſtances of like Subtilty and Texture, may be uſed with Succeſs: For the Seat and Cauſes of many Chronic Diſtempers lie moſt remote in the Courſe of Circulation, and their eluding the ordinary Means of Cure, it is to be feared, is owing to the Want of ſufficient Attention to that particular Management of efficacious Remedies, which is neceſſary to

carry

carry their Operations ſo far; an ordinary Judgment knows, how to intend, or remit, the Efficacies of Medicines by acuating their Points and Quantity of Impulſe, or ſoftening and weakening them with Broths, and the groſs expreſſed Oils of Almonds, or Linſeeds, in the firſt and larger paſſages; but an active Medicine, or a diſtempered irritating Salt, in the minuteſt Capillaries and Fibres, is not to be managed by ſuch coarſe Inſtruments.

Of the Plague at Conſtantinople. *By* Emanuel Timone, *M. D.* N°. 364. *p.* 14.

IX. Peſtem *Conſtantinopoli* ex *Ægypto* communicatam tum hiſtoriis, tum quotidianâ obſervatione conſtat. Nidum tamen in hac urbe ſibi fecit, & quamvis nunquam fere veteris Peſtis deſint ſeminia, novus etiam ſubinde fomes advehitur. Ab hyemali intenſo frigore ſatis bene ſopitur; emicant tamen hinc inde ſcintillae aliquot hyeme & vere: aeſtate incrementum ſumit; autumnali tempore ſummo flagrat incendio. Venti Aquilonares ſtatis temporibus aeſtate flantes (Eteſiae ſcil. hujus loci) quamvis frigidiuſculi ſint, veneni tamen peſtilentialis dilatationi haud obſiſtunt. Auſtrales ſatis calidi, ſi conſtanter flent, aeſtivo tempore Peſtem ſupprimunt. Quoad ſymptomata Peſtis *Conſtantinopolitana* adamuſſim reſpondet peſti Noviomagenſi annorum 1636 & 1637, ab *Iſbr.* de *Diemerbroeck* deſcriptae, Humanum genus invadit, *cap.* 4. *Diemerbr.* Compertum tamen eſt unum vel alterum, equum, canem, felemve peſte bubonaria correptum, & mortuum. Vulgus (praecipue, cui anguſta domi res eſt) tum Turcarum, tum etiam Chriſtianorum, Hebraeorumque facile ſibi perſuaſum habet divinitûs miſſam peſtem; hinc non cavet à contagio: Politiores, & praecipuè Chriſtiani ſibi cavent.

Symptomata à * dicto auctore enumerantur iſta, febres, bubones, carbunculi, exanthemata, capitis dolor phrenitis, ſopor, vigiliae, anxietas, debilitas, ſeu magna virium proſtratio, viſus turbulentus, cordis palpitatio, linguae ſiccitas, vomitus, ſingultus, lumbrici, fluxus alvi, haemorrhagia narium, menſtruorum profluvium, ſanguinis mictus, ſputum cruentum, dolores lateris, hepatis, renum, aliarumve partium.

His adjicio ego laſſitudinem artuum ulceroſam, horripilationem, ſubſequente aliquando calore, ſaepius non ſubſequente, nauſeam ſine vomitu, vertiginem, & motus vertiginoſos, tremorem manuum ſtatim à morbi initio. Nullum ex omnibus ſymptomatibus eſt inſeparabile, imo nec tria illa peſti ſpecialia, bubones dico, carbunculos, & exanthemata; febris ſaepiſſime abeſt; ita ut regula iſta generalis ſtabiliri poſſit: *Quando adſunt manifeſta peſtis ſigna, certo ſtatuere poſſumus morbum eſſe peſtem: ſed quando abſunt ſigna iſta, non poſſumus certò ſtatuere contrarium.* Multis enim peſte correptis, leni praecedente rigore, quo nec catarrho ſe laborare quis ſuſpicaretur, per plures dies ex iſtis ſignis non manifeſtatur nec minimum, poſtea autem catervatim erumpunt. Nonnulli poſt ſuſceptum contagium leviſſimo tantum

* *Cap.* 7. Diemerb.

languore attacti, mox erectè obambulant, & conſueta munia ſine incommodo exercent; tertiâ autem, vel quartâ die ſtatim corruunt, animamque exhalant in viâ: & nequis ſuſpicetur apoplexiam vel quid aliud, poſt mortem demum nigrae maculae deprehenduntur: fidem etiam facit tum praecedens cauſa contagii manifeſtiſſima, tum propagatum poſtea contagium. Multi etiam ſine ullâ manifeſtâ laeſione erectè obambulantes ſanantur, erumpentibus etiam bubonibus & carbunculis. Plerique tamen febricitant, & graviter aegrotant. Vomitus & alvi fluxus cum ſubitâ virium concidentiâ, & cum febre peſtem indicant, & ſine febre adhuc magis. Minime ex ſignis ſuſpectis ſi dolor in emunctoriis communibus jungatur, pronunciandum eſt eſſe peſtem

Puſtula rubicunda ad ſemi-ciceris magnitudinem in extremo purulenta maligna eſt: in lividum enim carbunculum brevi excreſcit. Carbunculi in omnibus corporis partibus indifferenter erumpunt, non exceptis labiis, linguâ, bulbis oculorum, glande penis, &c. Bubones tantum in emunctoriis. Glandulae parvae durae circa collum malignae. Exanthemata ſemper ſunt lethalia. Bubones ſi cito ad ſuppurationem tendant, ſpem promittunt. Non malum eſt, ſi etiam non bene maturi ferro aperiantur. Multi per bubonis reſolutionem curati, annis ſequentibus, ſi peſte infecta loca petant, eo in loco dolorem obſcurum ſentiunt, in quo bubonem habuerunt. Peſtis in aliquibus individuis per plures dies latitare poteſt, & poſtea in actum erumpere. A peſte convaleſcere incipiens, ſi ante quadrageſimum gravem aliquem in diaeta errorem fecerit, novo erumpente bubone moritur. Pro monſtro habetur, ſi quis à peſte perfecte ſanatus eodem anno peſte corripiatur. Si diſpoſitionem corporum ad octo gradus placeat revocare; intacta peſte corpora diſpoſitionem habent ut ſeptem, & rudem merita ut unum. Infectas aedes per menſes aliquot impune incolens tandem peſte correptus fuit. * Senes difficillimè peſte corripiuntur, facillimè pueri. Exteri multo magis periclitantur, quam Cives. Armen iiomnium nationem minimè ad peſtem ſunt diſpoſiti. Obſervo illos pauciſſimis uti carnibus; cepis, porris, alliis, vinoque maximè utuntur. Caro porcina in peſte praeſentaneum venenum eſt. Nil aeque ad peſtem diſponit ac animi pathemata, ac praecipue intenſus moeror, & terror inopinatus. Lue venereâ infecti indifferenter ſe habent ad contagium: bubones tamen illis ſuppurantes in fiſtulas ut plurimum degenerant. Nitidae aedes haud aeque facile inficiuntur ac ſordidae. Cachectici, ictero laborantes, & variis aliis chronicis morbis conflictati homines dantur, & tamen peſtis ſpicula vel eludunt, vel ſuperant; roſeâ è contra facie praediti, & robuſtiſſimi moriuntur multi.

Suffumigia ex baccis Juniperi, pice, ſulphure utilia ſunt, ſi diu noctuque continuentur, ita ut ab inferiore parte totam penetrent domum. Odoramenta ex aceto haud inutilia cenſentur. Oleum ſuccini

* *Cap.* 4. Diemerb.

naribus

naribus illitum optimum eſt. Vinum moderate ſumptum, hilaritas animi, & bona victûs ratio haud parvi momenti ſunt in preſervatione. Phlebotomia damnatur, & praecipue ſera ; ſanguis è venâ ſectâ fluens, nullo modo multoties ſiſti poteſt ; ex ſcarificationibus etiam pro cucurbitularum applicatione factis ad plures horas, hoc eſt ad mortem uſque, ſanguinem vi magnâ effluxiſſe obſervatum eſt. Vomitoria levia non proſunt, fortia valde nocent: purgantia ſtatim enecant. Sola ſpes in ſudore, & alexipharmacis. Communiſſimè utuntur in hac urbe Theriaca Veneta. Lapis Bezoar, quamvis genuinus, nullius fere eſt momenti. Judaei acidis utuntur. Armenii & Graeci vino, & ſpiritu vini. A carnibus, & carnium juſculis relligiosè abſtinent Chriſtiani ad multos dies. Turcae etiam hanc diaetam non ſpernunt. Multi, queis parvus tuberculus nullo livore inſignis erupit, à carnibus abſtinentes, per hebdomadam ſani obambularunt, poſtea carnibus uſi breviſſimè mortui ſunt. Opium crudum, & opiata omnia bona ſunt pro ſcopo praeſervativo, ſaepe etiam pro curativo. Summum remedium Turcis magnatibus habetur oleum napthae, ſeu Petroleum albicans, ad duas uſque drachmas epotum in vehiculo ad libitum ; convenit hoc cum Camphorâ à noſtris tantopere celebratâ. Quidam multos ſanâſſe dicitur phlebotomiâ (primâ tamen morbe die) ad lipothymiam uſque celebratâ, propinato poſtea hauſtu aceti acerrimi, in quo ſanguinis draconis & boli armenae ana drachmam unam diſſolvebat. Phlebotomiae negotium in medium examinandum relinquo ; aſt certe praeſtantiſſimum remedium eſt. Frictio rubificans tum in pectore, tum in dorſo, in locis utrinque cordi reſpondentibus, cum allio contuſo fortiſſimè per aliquot horas celebrata proficua eſt. Radix hellebori, ſectione factâ, carni ad emunctoria tranſverſim infixa utilis eſt. Pulli gallinacei, vel columbini, ſeu vivi, ſeu per medium ſecti, bubonibus & carbunculis, & etiam regioni cordis appliciti, & ſaepiſſime iterati (ſed ultra ſemihoram non retinendi) utiliſſimi comperti ſunt. Oleum Succini, & extractum Juniperi in praxi feliciter ſucceſſerunt. Methodus praedicti *Diemerbroeck* per omnia utilis eſt huic peſti ; certè bene de Peſte ſcripſit auctor hic, excepto quod peſtis cauſam nimis alte deducat. *Barbette* etiam haud eſt contemnendus.

Anno 1712. Peſtis *Byzantii* in fine *Maii* Menſis incrementum ſumpſit. In fine *Julii* erat in ſummo furore. In determinato loco obſervatorem habui, qui mortuorum cadavera ad nonaginta & ſupra uno die numeravit. Eteſiae flabant vehementiſſime ; ceſſantibus Eteſiis, Auſter flavit ſatis intenſe. Primâ poſt Auſtri flatum hebdomadâ, cadavera non numeravit in die niſi circiter quadraginta ; ſecundâ hebdomadâ triginta circumcirca ; tertiâ minus viginti qui numerus in bonâ etiam urbis ſalubritate tali anni tempore ſingulis diebus non deeſt. Sic autumnali tempore peſtis ſopita eſt anno illo : ſed ut plurimum tali tempore ſaevire ſolet, & mediâ aeſtate, vel in fine aeſtatis incrementum ſumere. Peſtem vere incipientem, autumno ſopitam

pitam alias etiam obſervatum eſt. Notandum eſt poſt ſolſtitium aeſtivum peſtem in Ægypto, quamvis ferociſſimam, infallibiliter deſinere : cauſa altioris indaginis eſt. Climatis Ægyptiaci characteriſmus in hoc peculiari peſtis phaenomeno aliquatenus ad Smyrnam uſque inſulamque Chiam, ipſaque Helleſponti anguſtias ſeſe extendit. Obſervandum ulterius Eteſias, ventos ſcil. Aquilonares, curſum ſolis ſequentes, aërem vehere, non excrementitiâ ſolum humiditate, ſed nitroſis particulis valde ſaturatum & imbutum. Anſa mihi fuit hujus rei cognoſcendae veſtis quaedam, quâ nos utimur ex pilis caprarum textâ. Veſtis haec Hygroſcopii quoddam genus videtur ; nam quâ parte ſudore manuum, vel colli, fuerit antea madefacta, quamvis ſereſcat, & poſt multos etiam menſes in uſum denuo accipiatur, horâ tamen dimidiâ, vel unâ poſt ortum Solis, quando nimirum Eteſiae ſpirare incipiunt, talem madorem denuo contrahit, ut maculâ nigrâ intenſiſſimâ inficiatur. Veſtis poſt duas, vel tres horas denuo exſiccatur, & macula evaneſcit. Hic duo ſunt notanda : primum eſt ; ſi ſimplici aquâ veſtis illa fuerit ſaepius imbuta, & poſtea ſereſcat, haud ſuccedit hoc phaenomenon madoris & maculae, prout quando ſudore imbuta eſt : ſecundum conſideratione dignum eſt hoc : ſi forte fortunâ tempus ſit actualiter pluvium, haud aeque facile madere inficique maculâ veſtem illam, dummodo actualiter pluviae non exponatur ; ex quibus colligo, praeter aqueas particulas, nitroſis ſalibus imbutum aërem ex Ponto Euxino huc advehi primo Eteſiarum flatu. Particulae iſtae nitroſae à congeneribus ſalinis particulis à ſudore veſti illi communicatis fixantur & retinentur, & combinatione factâ maculam efficiunt. Salibus igitur iſtis imbutus aër fermenti peſtilentialis (quod indolis ſalino corroſivae eſſe probabile eſt) dilatationi fomitem praebere poteſt. *Ægyptium* autem aërem, mediante vento auſtrino huc pervenientem, ſumme rarefactum & talium expertem ſalium, Peſtis dilatationi obſiſtere poſſe veriſimile eſt : Adde, quod calidus Auſter corpora ad tranſpirationem magis diſponat.

Si quis quaerat interim, utrum Peſtis ſanguinis coagulationem vel nimiam diſſolutionem inducat? dico neutrum primario, & immediatae facere, ſed utrumque poſſe accidere tum proceſſu temporis, tum ratione maſſae ſanguineae, in variis individuis, quoad principia activa, variantis. Primario autem & immediate Peſtis ſpiritus adoritur : liquidis ſubſequenter, & ſolidis varia inducit mala, ſecundum varium tum liquidorum, tum ſolidorum ſchematiſmum. * Hinc varia ſymptomata in peſte, & ſibi è diametro oppoſita, quae unico remedio vinci non poſſunt, ſed prudentis Medici requirunt Judicium, ut, quod opportunum eſt, in actum deducatur. Generaliter tamen obſervandum, ut citiſſime generoſiſſima remedia, & in magna doſi propinentur : ut in principio oleoſo-balſamica, & ſpiritibus amica volatilia uſurpentur ; ut omnes evacuationes praeter ſudorem

* Diemerb. *cap.* 7.

vitentur

vitentur artificiales igitur non tentandae, naturales ſiſtendae ſuis quaeque appropriatis; (ſic alvi fluxus ſalutariter ſedatus fuit cl. yſtere aſtringente, cui Theriaca erat immixta) ſi ſpiritus ſint effraenes & peccent in motu aucto, quod à Vigiliis potiſſimum cognoſcitur, ut ſiſtantur per Opiata. Si contra necroſi, ſeu languore afficiantur, quod ab effectibus potiſſimum ſoporis cognoſcitur, ut ſuſcitentur per volatilia, & Camphorata: ut ſanguinis conſiſtentia integra ſervetur in proceſſu; mali, quod fit acidis & terreis adſtringentibus, ut Venenum ad peripheriam alliciatur.

Experiments made with the Bile of Perſons dead of the Plague at Marſeilles, *with what appeared upon the Diſſection of the Bodies; alſo ſome Experiments made with the Bile of Perſons dead of other Diſeaſes, by Dr* Deidier, *Prof. Phyſ.* Montpel.

X. 1. *Exp.* 1. The humane Bile, taken from the Gall-bladder of the Bodies of thoſe that died of the Plague at *Marſeilles*, has been always found to be of a black and greeniſh Colour. It has become conſtantly of a laſting Graſs-Green upon the mixing of Spirit of Vitriol with it; and always very yellow when we mix Oil of Tartar *per deliquium*, or the Alcalious fixed Salt of the ſame diſſolved in a ſufficient Quantity of Water. Theſe two Colours, green and yellow, have continued for whole Months. The ſaid Bile has become of a black Colour, like Ink, but ſoon fading, by the Affuſion of Spirit of Nitre.

Exp. 2. The Bile, taken from the Gall-bladder of the Bodies of thoſe that died of the Plague, having been poured into a Wound made on purpoſe in different Dogs, has rendered them thereupon melancholy, drowzy, and without caring to eat. All theſe Animals died in three or four Days with the eſſential Marks of the true Plague, declared by Buboes, Carbuncles, and gangrenous Inflammations in the *Viſcera*, in the ſame manner as in the human Carcaſſes from whence the Bile was taken.

Exper. III. A Drachm of the ſaid peſtiferous Bile having been mixed with two Ounces of Fountain-water made luke warm, and injected into the Jugular Vein of ſeveral Dogs, has rendred them preſently drowzy, and has killed them in four Hours, with gangrenous Inflammations, the Heart ſtuffed full of black thick Blood, the Liver ſwelled, and the Gall-bladder full of green Bile.

Exper. IV. The ſame Quantity of Bile, injected by the Crural Vein, has produced in the Dogs a Heavineſs in about an Hour. They have had ſuch ſtrong loathing of their Food, that they would not eat or drink the leaſt matter after the Injection was made. They piſſed frequently, eſpecially if they were ſtirred. On the third Day there appeared conſiderable Tumours under the *Axilla*, and on their Thighs, about 3 Inches from the Wound. The Wound turned to a Gangrene, and the Creature uſually died on the fourth Day, with all the Marks of the Plague.

Exper. V. A Dog, of the Hoſpital at the *Mail*, in *Marſeilles*, who followed the Surgeons when they went to dreſs the Sick, uſed greedily to ſwallow the corrupted Glands, and the Dreſſings charged with Pus that they took off the Plague-Sores; he licked up the Blood that he found ſpilt on the Ground in the Infirmary; and this he did for

about

about three Months, and was always well, gay, briſk, full of Play, and familiar with all Comers. We injected into the right Crural Vein of this Dog about a Drachm of the peſtiferous Bile, mixed with two Ounces of warm Water. He died the fourth Day, as the others did, with a Bubo on the wounded Thigh; on which likewiſe there were two Carbuncles, and the Wound gangrened. What we took particular Notice of in this Dog was, that after the Injection, both when he was living, and after he was opened, when dead, he had a very ſtinking Smell, which we did not obſerve in any of the others. He had moreover a conſiderable Hæmorrhage from the Wound, the Night before he died, having ſtruggled hard to eſcape out of his Confinement.

Exper. VI. The 2d of *May* having injected about a Drachm of human Bile, taken from Perſons dead of the Plague, mixed with 2 Ounces of warm Water, into the Crural Vein of a Dog; the Creature was preſently drowzy, refuſed his Food, and died about the third or fourth Day after the Injection, with all the inward and outward Marks of the Plague that the others had.

Exper. VII. The 6th of the ſame Month we collected the Bile of this Dog dead of the Plague, and injected it by the Crural Vein into the Blood of another Dog; who, preſently after the Injection, had convulſive Motions all over him, which was followed by a Lethargic Heavineſs. On the 2d Day after the Injection, there appeared a Carbuncle upon the great Pectoral Muſcle on the right Side. The third Day there aroſe a conſiderable Bubo on the Thigh; and the Dog died the ſame Day. Upon opening the Body, we found the fore part of the Breaſt all gangrened under the Teguments; and, in the inward parts, the *Viſcera* were full of black clotted Blood; as in all the reſt. The outward Surface of the Lungs was all Purple; the Heart was ſwelled as big again as uſual, with the four Cavities full of black clotted Blood. The Creature had lived 3 Days from the Injection without eating or drinking. The 10th of *May*, we injected the Bile of this ſecond Dog into the Crural Vein of a third Dog, who was thereupon ſeized with violent Convulſions, and different convulſive Motions, for about half a quarter of an Hour. When he was recovered from theſe, he appeared dull, and ſleepy; he vomited with violent Strainings. The Vomiting was followed with a Hickup. He eat a little boiled Meat, having faſted a good while before the Injection was made; but he vomited it up two Hours after he had taken it. He died the third Day with the ſame Symptoms of the Plague that the other Dogs had.

The State of the Bodies of Perſons dead of the Plague, from which the Bile was taken for the Expements before-mentioned.

One *Belefleur*, a Soldier, of 25 Years of Age, of a ſtrong robuſt Conſtitution, having a flattiſh Bubo growing on the hollow of the right Groin, died delirious. We found his Heart of an extraordinary Bigneſs, ſtuffed with black clotted Blood. His Lungs covered with a livid Purple, and ſticking a little to the *Pleura*. The Liver was double

double the natural Bigneſs, and ſtuffed with a thick Blood. The Gall-bladder was full of a black and greeniſh Bile. The *Dura* and *Pia Mater* by their Blackneſs ſeemed to have been ſeized with a gangrenous Inflammation. The inward Subſtance of the Brain was ſprinkled over with an infinite Number of ſmall livid Spots.

Mary Piſanne, aged 30 Years, of a ſanguine Habit, had a *Bubo* under her right Armpit, with a *Delirium* that was followed by a mortal Sleepineſs. In the opening of her Body, we remarked, that the Lungs were in their natural State. The Heart was of a prodigious Bigneſs, full of black coagulated Blood, with the left Auricle livid and gangrenous. The Liver, which was much enlarged, was all covered with Purple; and the Gall-bladder filled with a black and greeniſh Bile. The Head was not opened. *The ſecond Body.*

Peter Moulard, of a tender, feeble Conſtitution, about 14 Years of Age, had a *Bubo* under the Hollow of the right Groin very deep, and that never came well out. He became delirious with Convulſions, in which this Child died. We found in his Body his Heart of double the Bigneſs that it ought naturally to be, containing a black thick Blood: His Lungs were beſprinkled with livid Spots. The Gall-bladder full of black and greeniſh Bile. The Head was not opened. *The third Body.*

Jean Raynaud, Cook, aged about 25 Years, of a melancholy Temperament, had the whole Habit of his Body covered with a purple livid Colour, and a *Bubo* under his left *Axilla*; he died in a delirious Phrenzy. We found in his Carcaſe two Abſceſſes, one between the Teguments and the left great pectoral Muſcle, and the other in the Breaſt between the *Sternum* and the *Mediaſtinum*. His Heart was very large, filled with black thick Blood. The right Auricle was of the Breadth of three Inches; the left was in it's natural State. His Lungs were covered with little livid Spots, remaining ſoft and pliant, without any hardneſs in the Subſtance of them. The Liver was larger and harder than ordinary, and was alſo full of livid purple Spots; and the like were found in the Subſtance of his Brain, of which all the Veſſels were filled with black thick Blood. *The fourth Body.*

Jaques Audibert, aged about 35, of a melancholy Complexion, four Months after he had been cured of the Plague, the Mark of which was a *Bubo* in the fold of the right Groin, which came well to a Suppuration, was attacked afreſh with 3 Carbuncles; one in the middle of the Arm, and the other two in the fore Arm. He had but little Fever, with ſome ſmall Sickneſs at Stomach; but a *Delirium* coming of a ſudden, carried him off. Upon opening his Body, we found his Heart of a prodigious Bigneſs. The right Auricle being of the breadth of five Inches, and the left of three. We found a little Impoſthume upon the Body of the *Aorta*. The Lungs were covered with livid Spots, and the Liver appeared gangrenous. The Gall-bladder *The fifth Body.*

was of a very black Colour. The *Duodenum* and the *Rectum* were inflamed. We did not open the Head.

The ſixth Body. *Venture Cajoule*, about 40 Years of Age, of a melancholy Temperament, died without any outward Eruption on the third Day, of a violent Fever, with a Sleepineſs. We found the *Mediaſtinum* torn towards the upper part. The *Pericardium* was of a livid Colour. The Heart larger than in it's natural State, by the ſwelling of it's Ventricles full of black thick Blood, as in the other Carcaſſes. The Liver alſo was very large, and of a livid Colour, with a carbuncular Puſtule on the Side of the Gall-bladder; this was filled with very black Bile.

The ſeventh Body. *Margueritte Bachire*, aged 18 Years, of a lively vigorous Conſtitution, having two carbuncular Puſtles on the middle and inſide of the Thigh, with a ſharp Pain in the Head, died delirious. We found the Coverings of the Brain of a blackiſh red; the cortical Part of a livid Colour, and the Medullary ſprinkled with a few black Spots; the Heart of a prodigious Size, full of a thick black Blood: The Liver alſo very large, and the Gall-bladder very full of a black and green Bile. There were ſeveral livid Spots upon the Surface of the Inteſtines.

The eighth Body. *Louiſe Bellingere*, 20 Years of Age, having a *Bubo* in each Fold of the Groin, died very ſuddenly without any dangerous Symptoms. We found her Heart all covered with a livid Purple, much larger than natural, filled with thick black Blood, having a *Polypus* in each Ventricle. The Lungs were in their natural State. The Liver of a prodigious Greatneſs; and the Gall-bladder full of Bile, of a deep green Colour.

The ninth Body. One named *Rampeau*, a Peaſant, aged about 20 Years, of a ſanguine robuſt Conſtitution, having had a carbuncular Parotide for the Space of eight Days, accompanied with a burning Fever, was carried to the Hoſpital the 2d of *May*, where he died the 5th. We found the outward Part of the left Side of the Lungs covered with a livid Purple. The Heart was of double the bigneſs, having ſcarce any Blood in the Ventricles, whoſe Cavities were filled each with a large *Polypus*, that on the right Side having dilated the Auricle to the breadth of four Inches. The Liver alſo was larger than ordinary, and the Gall-bladder was full of a black and green Bile,

The following Experiments were made at Montpelier, *in the Hoſpital of St* Eloy, *during the Months of* Sept Octob. *and* Nov. A Soldier, between the Age of 20 and 25, of a lively briſk Temper, being ſick in the Hoſpital of *St Eloy* of an ordinary malignant Fever, died about the 15th Day by a Defluxion upon his Breaſt. His Lungs were found very much blown up, filling all the Cavity of the Breaſt, and adhering to the *Pleura*. Having remarked that the Bile in the Gall-bladder was of a bright Graſs-green Colour, we gathered it for the following Experiments. This Bile, being mingled with four Ounces of warm Water, was part injected into the Jugular Vein

Vein of a Dog, and a Compreſs ſoaked in the reſt of the Liquor was applied to the reſt of the Wound. The Creature thereupon appeared heavy and ſleepy, and would neither eat nor drink; the third Day he eat and drank willingly. The Compreſs falling off the fourth Day, the Wound was diminiſhed one half, and was healed by little and little, and the Dog grew perfectly well.

The eighth Experiment.

A Peaſant of about 50 or 60 Years old, of a melancholy Temperament, had been near a Month in the Hoſpital with an ordinary malignant Fever, having alternatively a *Delirium* and a Sleepineſs. After his Death, the Bile was found extreme thick, and black as Ink, and a great deal of it. We put about a Drachm in a Wound made for that purpoſe on the outer Part of the right Thigh of a Dog, thruſting in Pledgets dipped in the ſaid Bile diluted, into the Wound. There did not appear any Change in the Dog. We made him ſwallow ſome of the ſame Bile, without loſing his Appetite; and ſeeing he was like to do well, we left the Wound to itſelf, which healed in 15 Days only by the Dog's licking it.

The ninth Experiment.

Being willing to inject ſome of the ſame Bile into the Crural Vein of another Dog, and the Syringe being ſtopped by the too great Thickneſs of the ſaid Bile, the Injection could not be made; wherefore we took a Pledget ſoaked in as much of this Bile diluted, as it could take up, and applied to a freſh Wound made in the inſide of the right Thigh. The Pledget was faſtened within the Skin by ſome Needles. This Application produced no conſiderable Alteration in the Dog; he neither appeared ſleepy nor ſtomachleſs; but licked his Sore readily enough; and after the Pledget was fallen off, the Wound healed, as in the foregoing Experiment.

The tenth Experiment.

About a Drachm of the ſame black Bile drawn from the ſame Carcaſe, and mixed with warm Water, was injected into the Jugular Vein of another Dog. The Creature was not incommoded thereby, but was as briſk as before the Injection, only he appeared very thirſty, and he drank with Greedineſs. The next Morning being willing to view the Wound, we found it black and dry, and the Dog becoming ſurly, bit one of the Aſſiſtants. The two Ligatures made for the Injection were taken away without our ſeeing any Blood to run out. We applied a Doſſil, charged with the ordinary Digeſtive, and kept on by a Bandage; and about 4 Hours after the Dreſſing, we found the Dog dead, having lived 23 Hours after the Injection. Having opened him, we found that his Heart beat ſtill with Violence; and the Beating ceaſing, there was no Blood either in the Ventricles or the Auricles. This Liquor crowded together in the great Veſſels, appeared of a lively red, and very fluid, without any of thoſe Concretions that we conſtantly obſerved in all the Bodies that died of the Plague. Here appeared neither internal nor external Marks of the Plague.

The eleventh Experiment.

An Inhabitant of *Montpelier*, aged about 30 or 35, very fat and robuſt, of a ſanguine Complexion, having had a Fall upon the Pavement, had received a ſimple Wound on the upper part of his Forehead on the right Side. This being neglected, brought on an *Eryſipelas* all over his Face, which was accompanied with a Swelling of the left *Parotide*. This appeared and diſappeared thrice from Morning till Night. The *Eryſipelas* came ſuddenly on; he grew delirious, and died after 15 or 20 Days Illneſs, reckoning from the Fall. In the opening of the Body, we found a quantity of Water between the Skull and the *Dura Mater*. The Brain, which was firmer than ordinary, was a little red, and part of the *Pia Mater*, covering the hinder part of that *Viſcus*, appeared inflamed. There was about half a Septier of Water of a yellowiſh Colour, ſhed in the Cavity of the Breaſt. The great right Lobe of the Lungs was a little hard on the upper part. The Heart had a *Polypoſe* Concretion in each Ventricle: We found likewiſe two Pints of limpid Water got forth into the lower Belly. All the Fat of his Carcaſe was yellow. The Liver appeared to us a little ſwelled, and the Gall-bladder almoſt empty, not having above two Drachms of yellow Bile in it. That Bile of this Carcaſe, mixed with ℥ij of warm Water, was injected into the Crural Vein of a Dog. The Creature eat and drank heartily after the Injection, and did not appear at all incommoded. The Wound bleeding much, we were obliged to fill it with reſtringent Powders, kept in by a Pledget and a convenient Bandage. Twenty-four Hours after, the Dreſſing was taken away, the Wound appeared black and dry. The Dog licking it, it ſuppurated the next Day, and afterwards became red and well coloured; and the Wound was leſſened one half in 8 Days, during which time, the Dog appeared in perfect Health.

The twelfth Experiment.

Eight Days after the foregoing Experiment, the Dog, that was the Subject of it, was killed by about half a Drachm of Powder of *Hungarian Vitriol*, diſſolved in a Spoonful of warm Water, which we injected into the Jugular Vein. The Creature died on the Spot, with univerſal Convulſions. His Heart was found full of grumous Blood reduced to a kind of thick Pap, but without any Clods. The Bile of this Dog was yellow and in little quantity. Not being able to inject it into the Crural Vein of another Dog, becauſe the Vein was too ſmall, we contented ourſelves to dip two Compreſſes in this Bile, which we applied and kept under his Skin, by two Wounds made on purpoſe in this ſecond Dog: There arrived no notable Change. We obſerved in theſe two Dogs no Marks, either internal or external, of the Plague.

Another Experiment by the ſame. N°. 373. p. 105.

2. We cauſed two Dogs to ſwallow a pretty large Quantity of the Bile, taken from the Bodies of Perſons dead of the Plague. Upon this, they appeared heavy and melancholy, refuſed their Food, and made Water very often, eſpecially when they were any ways diſturbed.

disturbed. Their Urine was thick, and very fetid, and their gross Excrements were tinged with the black and greenish Bile, which they had swallowed. But in a few Days those Accidents went off, and the Dogs recovered their perfect Health, though they were all the time confined in a Cellar, belonging to the Dispensary, in company with the other Dogs that we tried our Experiments upon.

An Experiment made with the Blood of a Person dead of the Plague. By M. Couzier, Physician in the Infirmaries at Alais, No. 372. p. 103.

XI. I took a Quantity of Blood from the Body of a Person dead of the Plague, and mixed it with warm Water, which Mixture I attempted to inject into the Crural Vein of a Dog, but the End of the Syringe being too large to enter the Vein, the Experiment did not succeed. This made me resolve to try to lay some of the same infected Blood upon the Wound. This I accordingly did, and covered it with a Dressing, which the Dog got off in the Night. I found the next Morning, that the Dog had licked his Wound, and that he refused his Food. Towards Night, he began to bemoan himself, and gave Signs of an approaching Death. The next Morning I found him dead, the Wound being considerably swelled and gangrened, and the Edges round the Swelling were likewise gangrened.

Upon opening the Body, we found the Liver something larger than usual, with Spots of a livid Purple, as in the Bodies of Persons dead of the Plague. In the Stomach, was found a Quantity of black coagulated Blood, of the Size of a Hen's Egg. This in all likelihood was what he had swallowed upon licking the Wound. The Heart was very large, with a black grumous Blood in the Ventricles, and the Auricles were turned blackish and gangrenous.

The Way of inoculating the Small Pox in New-England *communicated by* Hen. Newman, *Esq*; No. 370. *p.* 33.

XII. 1. We make usually a couple of Incisions in the Arms, where we make Issues, but somewhat larger than for them, sometimes in one Arm, and one Leg. Into these we put bits of Lint (the Patient at the same time turning his Face another way, and guarding his Nostrils) which have been dipt in some of the Variolous Matter taken in a Vial, from the Pustules of one that has the Small-Pox of the more laudable Sort, now turning upon him, and so we cover them with a Plaister of *Diachylon*. Yet we find the Variolous Matter fetched from those, that have the inoculated Small-Pox, altogether as agreeable and effectual as any other. And so we do, what is taken from them that have the Confluent Sort. Within 24 Hours, we throw away the Lint, and the Sores are dressed once or twice every 24 Hours with warmed Cabbage Leaves. The Patient continues to do all Things, as at other times, only he exposes not himself unto the Injuries of the Weather, if that be at all tempestuous. About the 7th Day, the Patient feels the usual Symptoms of the Small-Pox coming upon him; and he is now managed as in an ordinary putrid Fever. If he cannot hold up, he goes to Bed; if his Head achs too much, we put the common Poultice to his Feet; if he be very sick at the Stomach, we gave him a gentle Vomit, yea, we commonly do these Things almost of Course, whether we find the Patient want them or no. And we reckon

reckon, the ſooner we do theſe Things, the better. If the Fever be too high, in ſome Conſtitutions, we bleed a little; and finally, to haſten the Eruption we put on a couple of Bliſters. On or about the third Day from the Decumbiture, the Eruption begins. The Number of the Puſtules is not alike in all, in ſome they are a very few, in others they amount to a Hundred; yea, in many they amount unto ſeveral Hundreds; frequently unto more than what the Accounts from the *Levant* ſay, is uſual there. The Eruption being made, all Illneſs vaniſhes; except perhaps, a little of the Vapours in thoſe that are troubled with them; there is nothing more to do, but to keep warm, drink proper Tea's, eat Gruel, Milk Pottage, Panada, Bread, Butter, and almoſt any Thing equally ſimple and innocent. Ordinarily the Patient ſits up every Day, and entertains his Friends, yea, ventures upon a Glaſs of Wine with them. If he be too intent upon hard Reading and Study we take him off. Sometimes, though the Patient be on other Accounts eaſy enough, yet he cannot ſleep for divers Nights together. In this Caſe, we do not give him Anodynes or Opiats, becauſe we find, that they who have taken theſe Things in the Small Pox are generally peſtered with miſerable Biles after their being recovered: So we let them alone; their Sleep will come of itſelf, as their Strength is coming on. On the 7th Day, the Puſtules uſually come to their Maturity; and ſoon after this, they go away, as thoſe of the Small Pox in the Diſtinct Sort uſe to do. The Patient gets abroad quickly, and is moſt ſenſibly ſtronger, and in better Health than he was before. The Tranſplantation has been given to Women in Child-bed, Eight or Nine Days after their Delivery; and they have got earlier out of their Child-bed, and in better Circumſtances than ever in their Lives. Thoſe that have had ugly Ulcers, long running upon them, have had them healed up. Some very feeble, crazy, conſumptive People, have, upon this Tranſplantation, grown hearty and got rid of their former Maladies. The Sores of the Inciſion ſeem to dry a little in three or four Days of the feveriſh Preparation for Eruption. After this, there is a plentiful Diſcharge at them. The Diſcharge may continue a little while after the Patient is quite well on other Accounts; but the Sores will ſoon enough dry up of themſelves; but the later, the better, as we think. If they happen to be inflamed, or otherwiſe troubleſome, we preſently help them in the Ways we do any ordinary Sores.

Concerning the Inoculation of the Small Pox. By Dr. Nettleton, *Phyſician at* Halifax *in* Yorkſhire. N°. 370, *p.* 35.

2. In *December* 1721, I firſt began to put this Method in Practice, and finding it to ſucceed beyond my Expectation in the firſt Inſtance, I was encouraged to repeat it upon ſome others, and afterwards ſeveral, ſeeing with how much eaſe theſe got through the Diſtemper, were deſirous to have the ſame done to themſelves, or their Children; ſo that there are now upwards of forty here, who have received the Small Pox by Inciſion; who are all got well through the Diſtemper, and are at this time in very good Health. Only one that was inoculated, did

did die; of which I ſhall give you a particular Relation hereafter, and refer it to your impartial Judgment, whether that ought to caſt any Blemiſh upon the Operation or no.

What was done by Way of Preparation, was chiefly purging with Rhubarb for Children, and ſometimes Vomiting or Bleeding for grown Perſons; and many have had no Preparation at all. But I always found, as far as I was able to judge, That thoſe, whoſe Bodies were well prepared by ſuch proper Methods as their different Ages or Conſtitutions did ſeem to require, had more favourable Symptoms than others in like Circumſtances, where that was omitted.

The Method which I always took in the Operation, was to make two Inciſions, one in the Arm and another in the oppoſite Leg. It is not material, as to raiſing the Diſtemper, whether the Inciſions be large or ſmall; but I commonly found, that when they were made pretty large, the quantity of Matter diſcharged afterwards at thoſe Places was greater; and the more plentiful that Diſcharge, the more eaſy the reſt of the Symptoms generally are, and they are alſo by this Means the beſt ſecured from any inconvenience which might follow after the Small Pox are gone off.

At firſt I collected ſome of the Matter from the Puſtules of one, who had the Small Pox of the natural Sort, into a Shell or Vial, and infuſed two or three Drops of it into the Wound; but finding it to be very troubleſome and difficult to get any quantity of the Matter, and obſerving alſo, that the leaſt imaginable will be ſufficient for the Purpoſe, I commonly take ſmall Pledgets of Cotton. and ripping the Puſtules, when they are ripe, with the point of a Lancet, roll the Pledgets over them, till they have imbibed ſome of the Moiſture. I put one of theſe upon each Wound, and cover it with any common Plaiſter till the next Day, when I commonly take away both the Cotton and the Plaiſter, leaving the Wound to itſelf, only covering it with a ſlight linnen Roller, to defend it from the Air. I have ſometimes rubbed the Pledget only once over the Wound, without binding it on, which I found to anſwer the End as well; and from ſome other Obſervations I have made, I have been ſurprized to ſee the Small Pox produced this way, when I was very well aſſured, the quantity of Matter received into the Veſſels, could not amount to the hundredth part of a Grain.

The Perſons inoculated have not been confined to any Regimen, but only to be kept moderately warm; and thoſe, who were grown up, to live very temperate and regular, to keep their Minds eaſy and compoſed, and to uſe proper Means to drive away all Fear and Concern. Some have been obliged from the time of the Inciſion, to abſtain from Fleſh, and all ſtrong Liquors; but I found afterwards, that the Eruption did not proceed ſo well, when they were obliged to live too low. Perhaps in warmer Climates, where they are not ſo much accuſtomed to live upon Fleſh, ſuch Abſtinence may be neceſſary;

but here I find it beſt to let them eat and drink as uſual, though ſomething more ſparingly, till the Fever begins to riſe; and then, but not before, we enjoin ſuch a Regimen as is uſual in like Caſes.

The firſt Thing that occurred after the Inciſion, was the Inflammation of the Wounds, which commonly happened about the 4th Day, when they began to appear very red round about, and to grow a little ſore and painful; in about two Days more they began to digeſt and run. In ſome they begin to run ſooner, and the quantity diſcharged is much greater than in others. I generally found, that in thoſe who diſcharged moſt this way, the Fever was more ſlight, and the Small Pox fewer, though I have known ſome do very well when theſe Places have only appeared very red, but have ſcarce run any thing at all, as it uſually happens, when the Inciſion is made ſo ſuperficial as not to cut through the Skin.

About the 7th Day, the Symptoms of the Fever begin to come on, which are the very ſame, that we always obſerve in the Small Pox of the diſtinct Kind, in the natural Way. A quick Pulſe, great Heat and Thirſt, Pain in the Head and Back, and about the Region of the Stomach, vomiting, doſedneſs, ſtartings, and ſometimes Convulſions. All were not ſeized with all theſe Symptoms, nor in the ſame Degree or Continuance; ſome began on the 7th Day, and continued ill without any Remiſſion, till after the 11th; many not till the 8th or 9th Day; and the Fever in theſe, was more moderate with great Intermiſſions; and ſome have ſcarce had any Illneſs at all. During all this time, the Places of Inciſion continued to be very ſore, and ſwell very much, ſo as to appear very large and deep, and to diſcharge a great deal of Matter.

On the 10th Day the Small Pox moſt commonly did appear, ſometimes on the 9th, and ſometimes not till the 11th; but I never found that any difference of Age, Conſtitution, or any other Cauſe, ever made them vary above one Day from the 10th. The Number was very different, in ſome not above 10 or 20, moſt frequently from 50 to 200, and ſome have had more than could well be numbered; but never of the Confluent Sort. Their Appearance was the ſame with thoſe of the diſtinct Kind; they commonly came out very round and florid, and many times roſe as large as any I have obſerved of the natural Sort, going off with a yellow Cruſt or Scab as uſual; though it ſometimes happens, eſpecially when the Sores diſcharge a very great quantity of Matter, that they are both few in Number, and do not riſe to any Bulk; but having made their Appearance for four or five Days, they waſte inſenſibly away.

After the Small Pox come out, the Feveriſh Symptoms gradually abate, and when the Eruption is completed, they uſually ceaſe, without any ſecond Fever, or any farther trouble in any reſpect.

While the Puſtules were riſing, and for ſome time after they were gone, the Sores continued to ſwell and to run very much, the longer they

they did ſo the better; but they never failed to heal up of themſelves after a certain Time.

I very rarely ſaw Occaſion for any Medicines in the Courſe of the Diſtemper, only ſometimes when the Symptoms ran very high, I gave a gentle Anodyne, to be repeated as Occaſion ſhould require, and once or twice I thought it neceſſary to bliſter, and to uſe ſuch Medicines as are found to be moſt ſerviceable in the Small Pox of the natural Sort. After the Puſtules are gone away, they have always been purged twice or thrice, and ſometimes let Blood, which is all that has been uſually done. But though the Practice may ſeem to be very eaſy, yet it is an Affair of ſuch a Nature as to require the utmoſt Care, and I preſume it will never be undertaken without the Advice of Phyſicians to direct a proper Method of Preparation before the Inſition is made, as well as a juſt Regimen afterwards; to watch every Symptom, and lend Nature all proper Aſſiſtance, when ever it ſhall be requiſite. Where this is done, it will ſeldom fail of being attended with happy Succeſs.

It has happened in one Inſtance or two, that the Symptoms in the Diſtemper have been worſe than uſual; and ſome few, after the Small Pox were gone off, have been ſubject to other Indiſpoſitions. Of all which, I ſhall give you a particular Account.

* The firſt that was Inoculated, a Boy about a Year and half old, began to be ill on the 8th Day, and had a brisk Fever for two Days, then the Puſtules began to appear, which were but few in Number, and roſe very large. The Child was ſoon well, and continued ſo for about a Month, when being carried out, and kept a long time in the Cold, he fell into a feveriſh Diſorder, accompanied with a Cough, and was ill for four or five Days; after that time it went off, and he has ever ſince been in very good Health.

† The ſecond was a Girl of two Years of Age, in a Family where they had formerly buried three Children ſucceſſively of the Small Pox, and this they feared might undergo the ſame Fate. The Fever came on about the 7th Day, and ſhe continued very ill till the 10th, on which Day, about Noon, ſhe had a ſtrong convulſive Fit. In the Evening the Small Pox appeared, and though ſhe had more in Number than uſual, yet ſhe grew well as ſoon as they were fully come out, and has continued ſo ever ſince.

‖ The eighth and ninth were in a Family where they had four Children, none of whom had had the Small Pox. I was called to the Eldeſt, who was ſeized in the natural Way, with the moſt malignant Sort I ever ſaw, attended with the worſt Symptoms that could be, inſomuch that he died on the 4th Day, all full of purple and livid

* *Thomas Thorp*'s Son of *Halliſax*. † *Jer. Turner*'s Daughter.
‖ Mr. *John Simpſon*'s Children.

Spots. The Parents were very deſirous, that any Means might be uſed to preſerve the reſt; but here I was in great doubt and perplexity what part to act. I knew very well, that if I ſhould venture to make the Inſition, whatever ſhould happen would be charged upon that, and it was not improbable, but ſome of them might have already taken the Infection, in which Caſe it was uncertain what the Event might be. On the other hand, if it was omitted, I did very much fear they might all die; ſuch Inſtances having been known, and the Contagion which was got amongſt them, being of ſuch a deſtructive Nature. Wherefore I was willing to run the riſque of my Reputation, rather than that the Children ſhould all periſh. They were therefore all three inoculated the Day before the eldeſt died, after having told the Parents that I could not anſwer for the Succeſs, in caſe they had already catched the Infection, which would be known if any of them fell ill before the 7th Day. According as we feared, one of them began on the 2d Day, much after the ſame manner with the Eldeſt, and the Small Pox appeared on the 3d Day, or rather an univerſal Redneſs all over the Skin, interſperſed with many purple Spots. There were none of theſe Spots near the Places of Inſition, which began to ſwell a little, as uſual about the 4th Day, and the Small Pox roſe a little more about thoſe Places than elſewhere; but Nature was too far oppreſſed with the Violence of the Diſtemper, and though this Girl continued longer than her Brother, and was not delirous as he was, yet ſhe died on the 7th Day. I did not reckon this Child in the Number of thoſe who received the Diſtemper by Inoculation; for I thought there was ſufficient Reaſon to conclude, that ſhe had taken the Infection before; but of this, I muſt leave you to judge, as you pleaſe, I only give you a Relation of Facts. The other two continued well till the 8th Day, when they both fell ill together. The Small Pox came out on the 10th, of a very good Sort, though more in Number than ſome others had, and they both got very eaſily thro' the Diſtemper without any Indiſpoſition ſince. It was obſervable, that the elder of theſe Children, about the time of the Eruption, had many Spots appeared on him of a deep red Colour, very much like thoſe of the other two Children, which changed in them to Purples afterwards, which the Mother was very much concerned at, fearing they would prove the ſame in this; but when the Small Pox came out, theſe Spots grew gradually leſs, and at laſt quite diſappeared. The other Child had been very ſubject to Convulſions for a long time, when very young, and it was afflicted with the ſame very much, from the time that the Fever came on, till the Small Pox appeared.

* The twenty-ſeventh was a married Gentlewoman, aged about 26; who got very well through the Diſtemper; but about a Week after, was ſeized with a very great coldneſs and ſhivering, which were followed

* Mrs. *Breara* of *Elaid*.

by

by a burning Heat, with a great Pain and Diſorder in her Head, which continued for ſeveral Hours. She had ſome time ago an intermitting Fever, of which I took this to be a Paroxyſm, and expected it's Return, but ſhe felt no more of it, and has ever ſince continued in good Health.

Of her two Sons, who were both inoculated at the ſame time, the younger got thro' the Diſtemper with a great deal of Eaſe, the *Small-Pox* being few, and the Symptoms very ſlight; but the elder, a Boy about 5 Years old, fared quite otherwiſe. The Symptoms before the Eruption were more than uſually ſevere, eſpecially the Vomiting; the Puſtules appeared at the uſual Time, but more numerous than ordinary, and when the Eruption was finiſhed, the Fever did not ceaſe, as it has done in every Inſtance but this: On the 5th Day after he was ſeized, the ſwelling of his Face began, which was followed by a Pain and Swelling in his Throat, and a Salivation, which continuing till the 11th Day, were ſucceeded by a Swelling in his Hands and Feet, the uſual Symptoms of the diſtinct Sort when they are very full; and tho' there appeared ſome little Signs of Malignity, yet with the Uſe of Bliſters and the milder Cordials and Alexipharmics, the Puſtles roſe very large, and all Things went on very well, ſo that he got thro' the Diſtemper without any Danger, but with much more Pain and Trouble than any of the reſt have endured. After the *Small-Pox* were gone off, we found a hard Swelling upon his Shoulder, which diſabled him for ſome time from moving his Arm; but by the Uſe of ſome common Applications, that is entirely gone. In this Family the only Child they had before theſe, died of the *Small-Pox*, of a very malignant ſort, and this Boy was of an ill Habit, and has had many dangerous Illneſſes.

* The twenty-third, was a Girl about 9 Months old; in this Child, after ſhe was well of the *Small-Pox*, the Mother diſcovered that one of her Thighs was a little ſwelled, which was painful to her for ſome time, and made her unwilling to move that Part; there were alſo ſome ſmall Tumours in the Groin; but theſe went off in a few Days, there only remaining a Hardneſs about the Knee, which alſo diſappeared in a ſhort time without coming to Suppuration, and the Child is now in perfect Health.

† The thirty-ſeventh was a Girl 6 Years of Age; ſhe got very eaſily thro' the Diſtemper; but before the *Small-Pox* were gone, we found a ſmall Tumour upon the Muſcles of the Loins, which ripened very ſpeedily, and was opend and healed up in a very ſhort time. Her Siſter, a young Woman about 18, had alſo a Swelling of the ſame kind in her Leg, but it lay ſomething deeper, and gave her a great deal of pain for 3 or 4 Days; afterwards it diſcharged a great quantity of Matter, and was healed without any farther Trouble.

* Mr *Js. Hanſon*'s Daughter. † Mr *John Haigh*'s Daughters.

All the reſt, excepting theſe I have mentioned, got very well thro' the Diſtemper without any manner of Trouble, or Hazard, or any ill Conſequence afterward. Whether thoſe ſlight Indiſpoſitions, which ſome have been ſubject to afterward, were owing to the Inſition, I have not been able to judge; but I preſume what they have endured in the Courſe of the Diſtemper, and what has followed after, is not to be put in the Balance with what is undergone in the common way, by thoſe who are thought to come off very well; and if this Method were more generally practiſed, 'tis probable ſome Means would be found out, to prevent even theſe ſubſequent Diſorders, which are no more frequent, nor near ſo bad, as thoſe which follow the natural Sort.

In two Inſtances the Inoculation had no effect; the Reaſon of which in one * was, becauſe the Child had the *Small-Pox* before, as the Parents did believe; but the Diſtemper had been ſo favourable, as to leave it doubtful. † In the other, the Matter was taken, when the Puſtules were withered, and almoſt gone, and that little Moiſture which they contained, I ſuppoſe, had loſt it's Virtue; the Boy to whom it was made uſe of, was no way affected; the Places of Inſition did not at all inflame, or ſwell as uſual, nor did any Puſtules appear; but about a Month after, he was ſeized with the Diſtemper in the ordinary way, and did very well.

Some of thoſe who have been inoculated, that are grown up, have afterwards attended others in the *Small-Pox*, and it has often happened, that in Families where ſome Children have been inoculated, others have been afterwards ſeized in the natural way, and they have lain together in the ſame Bed all the time; but we have not yet found, that ever any had the Diſtemper twice; neither is there any reaſon to ſuppoſe it poſſible, there being no difference that can be obſerved, betwixt the Natural and Artificial Sort, (if we may be allowed to call them ſo) but only that in the latter the Puſtules are commonly fewer in Number, and all the reſt of the Symptoms are in the ſame proportion more favourable. There is one Obſervation which I have made, tho' I would not yet lay any great Streſs upon it, That in Families where any have been inoculated, thoſe who have been afterwards ſeized, never had an ill Sort of *Small-Pox*, but always recovered very well.

Continued by the ſame. N° 370. P. 51.

3. The Hazard in this Method is very inconſiderable, and in proportion to that in the ordinary way by accidental Contagion, ſo ſmall, that it ought not to deter any body from making uſe of it. In order to ſatisfy myſelf, what proportion the Number of thoſe that die of the *Small-Pox*, might bear to the whole Number that is ſeized with the Diſtemper, in the natural way, I have made ſome Enquiry hereabouts, and I ſhall take the Freedom to tranſmit the Accounts to you, becauſe

* *Mich. Bland*'s Daughter. † *William Clark*'s Son.

I believe

I believe you may depend upon their being taken with ſufficient Care and Impartiality. In *Halliſax*, ſince the beginning of laſt Winter, 276 have had the *Small-Pox*, and out of that Number 43 have died. In *Rochdale*, a ſmall Neighbouring Market-Town, 177 have had the Diſtemper, and 38 have died. In *Leeds* 792 have had the *Small-Pox*, and 189 have died. It is to be noted, that in this Town the *Small-Pox* have been more favourable this Year than uſual, and in *Leeds* they have been more than uſually mortal; but upon a Medium in theſe three Towns, there have died nearly 22 out of every hundred, which is above a *fifth Part*, of all that have been infected in the natural way. I have in theſe Accounts confined myſelf to the Limits of the Towns. The Numbers that have had the *Small-Pox* in the Country round about, is vaſtly greater; but the Proportion of thoſe that die is much the ſame. I have made the Enquiry in ſeveral Country Villages hereabouts, in ſome I found the Proportion to be greater, in others leſs, but in the main it is nearly the ſame.

Concerning the Inoculation of the Small Pox, and the Mortality of that Diſtemper in the natural Way; by the ſame, No. 374. p. 209.

4. There are two Propoſitions advanced by the Favourers of the Practice of Inoculation, concerning which the Public ſeems to require more full Satisfaction. *That the Diſtemper raiſed by Inoculation is really the* Small-Pox; and, *that it is much more mild and favourable, and far leſs mortal, than the natural Sort.*

The former of theſe is not ſo much diſputed now, as it was at firſt, when this Method was introduced, nor can it be made a Doubt of by any one, who has ſeen thoſe that have been inoculated, and has alſo been much converſant in the natural *Small-Pox*. There is uſually no manner of Difference to be obſerved betwixt the one Sort and the other, when the Number of Puſtules is nearly the ſame; but in both there are almoſt infinite Degrees of the Diſtemper, according to the Difference of that Number. All the Variation that can be perceived of the Ingrafted *Small-Pox* from the Natural, is, that in the former the Puſtules are commonly fewer in Number, and all the reſt of the Symptoms are in the ſame Proportion more favourable. They exactly reſemble what we call the Diſtinct Sort: The Symptoms before the Eruption are the very ſame, and when the Puſtules begin to riſe, their Appearance is the ſame, as well as their Periods of Maturation and Declenſion; they are at firſt of the ſame florid, roſy Colour; and when fully ripe, of as fair a yellow. They commonly riſe as round and as large as the other, and when they are very numerous, the Inflammation and ſwelling of the Face comes on at the uſual Time, and is followed by the ſwelling of the Hands and Feet, and only once I obſerved a Salivation, tho' the Puſtules were diſtinct. In the Natural *Small-Pox*, when the Puſtules are very few, we ſometimes obſerve, they do not riſe to ſo great a Bulk, neither do they ripen ſo fully, nor continue ſo long as uſual; and it is the ſame in the way of Inoculation. In ſhort, as this Diſtemper is raiſed by an Ingraftment from the *Small-Pox*, as it has the very ſame Appearance,

and

and as it is capable of producing the ſame by Infection, there ſeems to be no room to doubt of it's being the true and genuine *Small-Pox*. And if that be allowed, it will follow from thence, as a Corollary, that *Thoſe, who have been inoculated, are in no more Danger of receiving the Diſtemper again, than thoſe who have had it in the ordinary way.* And this is alſo thus far confirmed by Experience. We are very ready to own, that the Operation may ſometimes fail: Thoſe Gentlemen, who firſt communicated to the Royal Society ſome Account of this Practice from *Turkey*, did both of them intimate ſo much; tho' I believe that will but rarely happen. In one * Inſtance here, I obſerved no Eruption at all, neither did the Wounds inflame and ſwell any more than would have followed from a common Inciſion, which made me conclude, that what was applied had not taken effect, and indeed the Reaſon of it was very well known to me. In three others, tho' the Wounds did inflame, and ſwell, and diſcharge conſiderably, yet the Eruptions were ſo imperfect, as to leave me a little in doubt: But two of theſe have ſince been ſufficiently tried, by being conſtantly with thoſe who had the *Small-Pox*, without receiving any Infection; which makes me inclined to believe they will always be ſecure from any danger of it. As to all the reſt, neither I nor any body elſe, who ſaw them, did in the leaſt queſtion, but that they had the true *Small-Pox*.

As to the latter Propoſition; *That the Ingrafted* Small-Pox *is far leſs dangerous than the Natural:* The Truth of this, I ſuppoſe, can only be found by making a Compariſon, ſo far as our Experience will extend. In order to this, I have taken an Account in this Town, and ſome part of the Country, and have procured the ſame from ſeveral other Towns hereabouts, where the *Small-Pox* has been epidemical this laſt Year, with as much Exactneſs as was poſſible, how many have had the *Small-Pox*, and how many out of that Number have died.

	Have had the Small-Pox.	Died.
In *Halifax*	276	43
In a part of the Pariſh at *Halifax*, ſtretching towards *Bradford*	297	59
In another part of the ſame Pariſh	268	28
In *Bradford*	129	36
In *Leeds*	792	189
In *Wakefield*	418	57
In *Rochdale*	177	38
In *Aſhton under Line*, a ſmall Market-Town in *Lancaſhire*, including two neighbouring Villages	279	56
In *Macclesfield*	302	37
In *Stockport*	287	73
In *Hatherfield*	180	20
Total	3405	636

* *William Clark*'s Son. See Philoſoph. Tranſact. No. 370. p. 45.

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I am very ſenſible you will require a great Number of Obſervations, before you can draw any certain Concluſions. I would only crave leave to remark, that it appears from theſe Accounts, that this laſt Year, in this part of the Kingdom, almoſt nineteen out of every hundred, or *near one fifth of thoſe, who have had the Natural* Small-Pox, *have died*; whereas *out of* 61, *which have been inoculated hereabouts, not one has died*; for as to the Caſe of Mr *John Symſon*'s Daughter, which would have made the ſixty-ſecond, I leave it out of my Account, and I will refer it to any impartial Judgment, whether I may not juſtly do ſo. *

5. The Number of Perſons who have had the *Small-Pox* by Inoculation here in *England*, is, by the beſt Information I have been able to collect, as follows:

A Compariſon between the Danger of the Natural Small Pox, and of that given by Inoculation; by James Jurin, *M. D. R. S. Secr.* No. 374. p. 213.

Inoculated by	
Dr *Nettleton*	61
Claudius Amyand, Eſq; Serjeant-Surgeon	17
Mr *Maitland*, Surgeon	57
Dr *Dover*	4
Mr *Weymiſh*, Surgeon	3
The Rev. Mr *Johnſon*	3
Dr *Brady* at *Portſmouth*	4
Mr *Smith*, Surgeon, and Mr *Dymer*, Apothecary, at *Chicheſter*	13
Mr *Waller*, Apothecary, at *Goſport*	3
A Woman at *Leiceſter*	8
Dr *Williams*, at *Haverford-Weſt*	6
Two other Perſons near the ſame Place	2
Dr. *French*, at *Briſtol*	1
In all—	182

Out of this Number the Oppoſers of Inoculation affirm, that two Perſons died of the Inoculated *Small-Pox:* The Favourers of this Practice maintain, that their Death was occaſioned by other Cauſes. If, to avoid diſpute, theſe two be allowed to have died of Inoculation, we muſt eſtimate the Hazard of dying of the Inoculated *Small-Pox*, as far as can be collected from our own Experience, to be that of 2 out of 182, or 1 out of 91.

The Rev. Mr *Mather*, in a Letter dated *March* 10, 1721, from *Boſton* in *New England*, gives an Account, That *of near* 300 *inoculated there,* 5 *or* 6 *died upon it or after it, but from other Diſeaſes and Accidents, chiefly from having taken the Infection in the common way by Inſpiration, before it could be given them in this way of Tranſplantation.*

* *See* Philoſoph. Tranſact. No. 370. p. 41, 42.

If, as we have done before, to avoid all occaſion of diſpute, we allow 5 out of theſe 300 to have died of the *Small-Pox* by Inoculation, notwithſtanding what Mr *Mather* has ſaid of their dying by other Accidents or Diſeaſes; the Hazard of Inoculation will thence be determined to be that of 1 in about 60. But here it muſt be obſerved, that by all the Accounts from *New-England*, the Operators there appear not to have been ſo cautious in the Choice of their Subjects, as here in *England*. For Mr *Mather* tells us, that the Perſons inoculated were *young and old, from 1 Year to 70, weak and ſtrong*; and by other relations we are informed, that *Women with Child, and others even in Childbed*, underwent the Operation. Apparently the Greatneſs of the Danger they were in, from the Infection in the natural way, which then raged among them with the utmoſt Fury, made them the more adventurous.

We come now, to the ſecond Part of our Deſign, which is to form an Eſtimate of the Hazard, which all Mankind, one with another, are under of dying of the natural *Small-Pox*, that, by comparing this with the Hazard of Inoculation, the Public may be enabled to form a Judgment, whether or no the Practice of Inoculation tends to the Preſervation of Mankind, by leſſening the Danger to which they are otherwiſe liable.

With this View I have conſulted the yearly Bills of Mortality, as far back as the Year 1667, being the Year after the Plague and the Fire of *London*, comprehending to the preſent Time the Space of 56 Years, from 42, of which I have given Extracts in the two following Tables.

The firſt of theſe takes in the firſt 20 Years, diſtinguiſhing for every Year the total Number of Burials, and likewiſe the Number that died of the *Small-Pox*, in two ſeparate Columns. The third Column ſhews how many died of the *Small-Pox* out of every thouſand that were buried; and the fourth Column repreſents the Proportion between thoſe that died of the *Small-Pox*, and the whole Number of Burials, by the neareſt Vulgar Fraction, having always one for the Numerator.

The ſecond Table gives the laſt 22 Years, after the ſame manner; and at the bottom of each Table is given the total Number for each Series of Years, and likewiſe the Number that died each Year, taken at a Medium, one Year with another: By which it appears, that the Proportion between the Number of thoſe that die of the *Small-Pox*, and the whole Number of Burials, is very nearly the ſame, upon an Average for each Series of Years.

The 14 intermediate Years between 1686 and 1701, are left out, becauſe in the Bills for thoſe Years, the Accounts of the *Small-Pox* and *Meaſles* are not diſtinguiſhed, as in the preceding and following Years, but are joined together in one Article, ſo that from them no certain Account can be drawn of the Number of Perſons, that died of the *Small-Pox*.

TABLE I.

Years	Total No of Burials	Died of the Small-Pox. In all	In 1000	In Propor.
1667	15842	1196	75	3 1/3
1668	17278	1987	115	1/9
1669	19432	951	49	20
1670	20198	1465	73	1 1/4
1671	15729	696	44	2 1/3
1672	18230	1116	61	1 1/6
1673	17504	853	49	2 1/1
1674	21201	2507	118	1/8
1675	17244	997	58	1 1/7
1676	18732	359	19	5 1/2
1677	19067	1678	88	1 1/1
1678	20678	1798	87	1 1/2
1679	21730	1967	91	1 1/1
1680	21053	689	33	3 1/1
1681	23971	2982	125	1/8
1682	20691	1408	68	1 1/5
1683	20587	2096	102	1 0
1684	23202	156	7	149
1685	23222	2496	107	1/9
1686	22609	1062	47	2 1/1
20 Years	398200	28459	71 1/2	1 1/4
Each Y. at a *Medium*	19910	1423	71 1/2	1 1/4

TABLE II.

Years	Total No of Burials.	Died of the Small Pox. In all	In 1000	In Pro
1701	20471	1095	53	1 1/9
1702	19481	311	16	6 1/3
1703	20720	898	43	2 1/2
1704	22684	1501	66	1 1/5
1705	22097	1095	50	20
1706	19847	721	36	2 1/8
1707	21600	1078	50	20
1708	21291	1687	79	1 1/3
1709	21800	1024	47	2 1/1
1710	24620	3138	127	1/8
1711	19833	915	46	2 1/2
1712	21198	1943	92	1 1/1
1713	21057	1614	77	1 1/3
1714	26569	2810	106	1/9
1715	22232	1057	48	2 1/1
1716	24436	2427	99	1 0
1717	23446	2211	94	1 1/1
1718	26523	1884	71	1 1/4
1719	28347	3229	114	1/9
1720	25454	1440	57	1 1/8
1721	26142	2375	91	1 1/1
1722	25750	2167	84	1 1/2
22 Ye	505598	36620	72	1 1/4
Each Year at a *Medium.*	22982	1665	72	1 1/4
42 Ye.	903798	65079	72	1/1
Each Year in 42 at a *Medium*	21519	1550	72	1 1/4

By theſe Tables it appears, that *upwards of ſeven* per Cent. *or ſomewhat more than a fourteenth part of Mankind, die of the Small Pox*; and conſequently the Hazard of dying of that Diſtemper, to every individual born into the World, is at leaſt that of one in fourteen. And that this Hazard increaſes after the Birth, as the Child advanceth in Age, will appear from what follows.

From this Eſtimate it is demonſtrable, that, in the Caſe of Perſons actually having the Small-Pox, the Hazard that they run, one with another, of dying of that Diſtemper, is greater than that of one in fourteen; or, which is the ſame thing, *there muſt be fewer than thirteen, that recover, for one that dies of the Small-Pox.* For ſince one fourteenth part of Mankind die of the Small-Pox, and the other thirteen parts die of other Diſeaſes; if theſe thirteen have all had the Small Pox, and recovered from it, before they fell ill of thoſe other Diſeaſes of which they died, then juſt thirteen will have recovered from the Small-Pox, for one that dies of that Diſtemper: But, as it is notorious, that great Numbers, eſpecially of young Children, die of other Diſeaſes, without ever having the Small-Pox, it is plain, that fewer than thirteen muſt recover from this Diſtemper, for one that dies of it.

To determine exactly how many of theſe thirteen parts of Mankind, die without having the Small-Pox, is a very difficult Taſk: But it is eaſy to ſee, that a conſiderable Deduction is to be made from them.

In the firſt place, the two Articles of *Stillborn* and *Abortive Children*, which are put into the Yearly Bills, as part of the Number of Burials, are unqueſtionably to be deducted.

With theſe two, you will not, I believe, think it unreaſonable to join the following Heads, which, by the beſt Information I can procure, comprehend only very young Children, or at moſt not above one or two Years of Age. *Overlaid, Chryſoms and Infants, Convulſions, Horſeſhoehead, Headmoldſhot, Teeth, Water in the Head, Worms, Rickets, Livergrown, Chin-Cough, and Hooping-Cough*; which Articles in the yearly Bills for 22 Years laſt paſt, amount at a Medium to 386 in each 1000, of the whole Number of Burials.

It is true indeed, that, in all probability, ſome ſmall part of theſe muſt have gone thro' the Small-Pox, and therefore ought not to be deducted out of the Account: But then, on the other hand, as it is certain, that of the remaining $\frac{614}{1000}$ of Mankind, that are above one or two Years of Age, there are great Numbers that never have the Small-Pox, it will, I preſume, be judged to be no unequal Suppoſition, if I ſuppoſe all that are contained under the Heads abovementioned, to have miſſed that Diſtemper, when by way of Compenſation, I allow all the remainder of Mankind to undergo it; which

Conceſſion

Conceſſion is ſo large, that it will abundantly make up for what I aſſume too much in the former Suppoſition.

Allowing therefore, that out of every 1000 Children that are born, 386 die under one or two Years of Age, without having the Small-Pox, and 72 do ſome time or other die of that Diſtemper; it follows, that the Hazard of dying of it, to the remainder of Mankind, above one or two Years of Age, who are all ſuppoſed to undergo that Diſeaſe ſooner or later, is that of 72 out of 614, or nearly 2 out of 17: ſo that *no more, than between 7 and 8, can recover from that Diſtemper, for one that dies of it.* And if any conſiderable part of the aforeſaid remainder of Mankind, more than is allowed for above, do eſcape having the Small-Pox, then the Proportion of thoſe that recover from it, will be ſtill ſmaller.

This Conſideration ſhews the Fallacy of one plauſible Argument, that has been often made uſe of on occaſion of the preſent Diſputes about Inoculation: Which is, that whatever be the Danger of dying of the Small-Pox, to thoſe that actually have that Diſeaſe, yet, as great Numbers of Perſons never have the Small-Pox at all, this Danger is what any particular Perſon may never be in; and therefore it will be Madneſs to undergo the Hazard of Inoculation, be it great or ſmall, in order to prevent a Diſeaſe, which poſſibly may never befal one.

For if two parts in 17 of all Mankind, that are above one or two Years of Age, muſt ſooner or later die of the Small-Pox, it is plain, that how many parts ſoever of theſe 17 are ſuppoſed to eſcape that Diſtemper, the Mortality among the Remainder, who undergo it, muſt in proportion be ſo much the greater. As for inſtance, if 7 parts eſcape having the Small-Pox, and 10 undergo it, then 2 out of 10, or 1 out of 5, that have the Small-Pox, muſt die of that Diſeaſe.

And as it can never be known, whether or no any particular Perſon be one of thoſe, that are to have the Small-Pox; his Hazard of dying of that Diſtemper, being made up of the Hazard of having it, and the Hazard of dying of it, if he has it, will be exactly the ſame, namely, that of 2 in 17, or 1 in 8 or 9, whether the proportion of Mankind, that eſcape having the Small-Pox, be great or ſmall.

But as what has been ſaid concerning the hazard of the natural Small Pox, is taken from an Account of 42 Years; whereas the Hazard of Inoculation is eſtimated only from what has happened in the Space of about 18 Months, ſince which time it had it's firſt Riſe among us; it will perhaps be aſked by ſome Perſons, why we do not likewiſe make the Eſtimate of the Hazard of the natural Small-Pox, from the laſt two Years alone, without running back into ſo great a Number of Years before Inoculation was begun?

To which we anſwer, That the Proportion of thoſe that die of the Small-Pox, varies ſo much in different Years, as appears from the

Tables above, that it was impoſſible to come at any Certainty in this Point, from the Conſideration of the two laſt Years alone: And if any one ſuſpects us of Partiality in proceeding after the manner we have done, he need only caſt his Eyes upon the ſecond Table, where he will find, that the Mortality of the natural Small-Pox, for the two laſt Years, has conſiderably exceeded the Medium we have determined, from taking in 42 Years.

There is another Method, which, if it were put in practice in ſeveral large Towns, or Pariſhes, and for a ſufficient Number of Years, would enable us to come at a nearer and ſtill more certain Computation of the Proportion between thoſe that recover, and thoſe that die of the Small-Pox; which is, to ſend a careful Perſon once a Year, from Houſe to Houſe, to enquire what Perſons have had the Small-Pox, and how many have died of it in the preceding Year. This has been done by Dr *Nettleton* the laſt Year, at ſeveral Towns in *Yorkſhire*, *&c.* and the ſame was done at *Chicheſter* for the ſame Year, to the 15th of *October* laſt, by a Perſon of Credit, whoſe Account was communicated to me by Dr *Whitaker*. Such another Account has been tranſmitted to me from *Haverford-Weſt*, in *South Wales*, by Dr *Perrot Williams*, Phyſician in that Place. The Sum of theſe Accounts is as follows:

	Sick of the Small-Pox.	Died.
Several Towns in *Yorkſhire*	3405	636
Chicheſter	994	168
Haverford-Weſt	227	52
Total	4626	856

From which it appears, that, upon a *Medium* between theſe Accounts, there *died of the Small-Pox almoſt* 19 *per Cent.* or *nearly one in five*, of Perſons of all Ages, that underwent that Diſtemper. Which is the more to be remarked, for that *out of* 82 *Perſons*, that had the Small-Pox by Inoculation, the ſame Year, and in the Neighbourhood of the ſame Places, *not one miſcarried.*

Mr *Mather* obſerves, in his Letter mentioned above, that *out of more than* 5000 *Perſons that had the Small-Pox* at *Boſton* in *New England*, *within little more than half a Year*, *near* 900 *died*, which is more than one in ſix; and this Account added to thoſe from *Yorkſhire*, *Chicheſter*, and *Wales*, reduces the Proportion of thoſe that die of the Small-Pox to ſomewhat more than 18 *per Cent.* ſo that the Hazard of dying of that Diſtemper, to thoſe who are taken ill of it, is that of *one in between five and ſix*, or ſomething above *two in eleven.*

The Reſult therefore, of theſe Computations is, that if the ſame Proportions ſhould ſtill continue, as have hitherto been determined by Obſervation, we muſt expect,

That

That of all the Children that are born, there will, ſome time or other, die of the Small-Pox, *one in fourteen.*

That of Perſons of all Ages taken ill of the natural Small-Pox, there will die of that Diſtemper, *one in five or ſix*, or *two in eleven.*

That of Perſons of all Ages inoculated, without regard to the Healthineſs or Unhealthineſs of the Subject, as was practiſed in *New England*, there will die *one in ſixty*.

That of Perſons inoculated with the ſame Caution in the Choice of the Subjects, as has been uſed by the ſeveral Operators one with another, here in *England*, (if we allow in the two diſputed Caſes above-mentioned, that the Perſons died of the inoculated Small-Pox) there will die *one in ninety one.*

But if thoſe two Perſons be allowed to have died of other Accidents or Diſeaſes, then we ſhall have reaſon to think, as far as any Judgment can be made from our own Experience here in *England*, that *none at all* will die of Inoculation, provided that proper Caution be uſed; as we are informed, on all hands, is the Caſe in *Turkey*; where *out of many thouſands*, that, in the Space of about 40 Years paſt, have been inoculated in and about *Conſtantinople*, by one *Greek* Woman, who ſtill continues that Practice, notwithſtanding her extreme old Age, *not ſo much as one Perſon has miſcarried*, as I am aſſured by the ingenious Dr *le Duc*, a Native of *Conſtantinople*, who was himſelf inoculated there under the Care of his Father, an eminent Phyſician in that City.

6. In *May* 1721, the Small-Pox was brought into the Town of *Boſton*; in *June* it began to ſpread pretty much, and in the Month of *July* it was got into moſt Parts of the Town, and a conſiderable number of People died of it. At this time Inoculation was firſt put in Practice by Dr *Boyleſton*, who then performed it upon his own Child and a Negro-Servant, who both did well; notwithſtanding which, this Attempt gave great Uneaſineſs to the Neighbours. However the Practice went on, to the Number of about 40 Perſons, one of which was a Woman * of about 40 or 45 Years of Age, who got well over the Small-Pox, as her Huſband publickly declared, but had been before troubled with Hyſteric Fits, of which ſhe died ſome little time after. When about 70 Perſons had paſſed under the Operation, myſelf and Wife, who had hitherto been at a Place called *Roxbury*, a Mile from *Boſton*, went into Town and received the Small-Pox by Inoculation. We had it with all the Gentleneſs that was poſſible, neither of us having had a hundred Puſtules, or being ſenſible of any Fever worth mentioning; ſo that we did not find it neceſſary to keep our Beds for it.

The Succeſs of Inoculation in and about Boſton, *in* New England, *by Capt.* John Osborne, *who reſided in that Town and Neighbourhood during the whole time of that Practice.* No. 374. p. 225.

* Mrs *Dixwell.*

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In *Auguſt* the Small Pox in the natural Way proved more mortal, and Inoculation made a greater Progreſs, the People continuing to come into the Practice of it. A ſecond Perſon that died after Inoculation, was an Apothecary's Houſe-keeper, that was out of Town, till an *Indian* Maid got the Diſtemper in the ſame Houſe, and removed, and died. Upon which, this Woman coming to Town, her Maſter undertook to perform the Operation upon her, which by the Way was the firſt and laſt that he ever performed; and on the third Day, after the Inoculation, the Small Pox came out upon her very full; from which it was plain, that ſhe had taken the Infection before in the common Way.

The third Perſon that died after being inoculated, was a * Gentleman, that lodged in the ſame Houſe with my Wife and ſelf at *Roxbury*, who was under great and extreme Infirmity of Body, as myſelf was Witneſs, that we feared he would have lived but a ſhort time under it. His Friends much perſuaded him to make uſe of Inoculation, believing it would have carried off his Illneſs; but when he made the Experiment, he had not Strength to go through with it He was about 45 Years of Age.

His Siſter † was the fourth Perſon that died upon this Operation. She was about 40 Years of Age, of great Indiſpoſition of Body, and weak, as was her Brother.

The fifth, that died upon Inoculation, was a Woman Servant in a Houſe, where the whole Family, to the number of eight, were inoculated at the ſame time. She lay in a cold upper Room during her Illneſs, and was much neglected, the whole Family being down together, ſo that ſhe died merely for want of a little Attendance. This was in the Town of *Roxbury*, where obſerve, that 13 Men, Maſters of Families, got the Small Pox, and all died; which inclined the People to make uſe of Inoculation, having before been much againſt it, and there were 43 Men inoculated there, who all did well. The ‖ Miniſter of the Town was the firſt, that put it in Practice there, much againſt the Mind of his People at firſt, though afterwards they were very well pleaſed with it, ſeeing with what great Succeſs it was attended; and then whole Families came into it, and underwent the Operation. There were in all at leaſt 280 Perſons inoculated, that I knew of, and I ſuppoſe there might be about 20 or 30 more, but of thoſe I can give no certain Account.

A Method of procuring the Small Pox, uſed in South-Wales. *By* Perrot Williams, *M. D. Phyſician at* Haverford Weſt. No. 375. *p.* 262.

7. However new the Method of communicating the Small Pox may appear in this Kingdom; yet I am to acquaint you, that it has been commonly practiſed by the Inhabitants of this Part of *Wales*, time out of Mind, though by another Name, *viz.* that of buying the Diſeaſe, as I have been long ago acquainted by ſeveral, who procured the Diſtemper by that Means. There is a married Woman in

* John White, *Eſq;* † *Mrs* Wells. ‖ *The Reverend Mr* Walter.

the

the Neighbourhood of this Place, who practiſed it on her Daughter, about a Year and half ago, by which Means ſhe had the Small Pox favourably, and is now in perfect Health, notwithſtanding ſhe has ever ſince, without Reſerve, converſed with ſuch as have had that Diſtemper this laſt Summer.

In order to procure the Diſtemper to themſelves, they either rub the Matter taken from the Puſtules, when ripe, on ſeveral Parts of the Skin of the Arms, *&c.* or prick thoſe Parts with Pins, or the like, firſt infected with the ſame Matter. And notwithſtanding they omit the neceſſary Evacuations, ſuch as Purging, *&c.* yet, as I am informed, they generally come off well enough; and what is remarkable, I cannot hear of one Inſtance of their having the Small Pox a ſecond time.

8. Mr *George Owen*, a Counſellor at Law, ſolemnly declares, that having, when at School, above 20 Years ago, rubbed the Skin off his left Hand, where the Scar is now very viſible, with the back edge of his Penknife, till the Blood began to appear, he applied the variolous Matter to that Part; which by Degrees growing inflamed, about a Week afterwards he fell into the Small Pox; and that he has ſince frequently converſed with ſuch as were ſick of that Diſtemper. He ſays alſo, five or ſix more at leaſt of his School-fellows made the like Experiment on themſelves at the ſame time, with the like Succeſs. *Continued by the ſame.* No. 375. *p.* 263.

I have ſince talked with ſeveral more, who made the like Experiments on themſelves, ſome 20, ſome 16, *&c.* Years ago; who all poſitively affirm, they never had the Small Pox a ſecond time.

9. Mr *Owen* was about 15 Years of Age, when he made the Experiment on himſelf, and he queſtionleſs had the genuine Small Pox; the Signs of them on his Face, and the Mark on his Hand, where he applied the Matter, being ſtill ſo very viſible, as to put that Matter beyond Diſpute. The Phyſician, who then attended him, is dead. Though I cannot pretend to remember how many informed me of their procuring the Diſtemper in this manner; yet I can aver, that within the compaſs of twenty Years laſt paſt, I have been ſo often aſſured of the Truth of it, not by Children, but grown Perſons of undoubted Credit, that I am entirely ſatisfied, it has been an immemorial Cuſtom in theſe Parts; and not only practiſed by Boys, when at School, but alſo by many others of both Sexes more advanced in Years, and conſequently capable of diſtinguiſhing the Small Pox from other Diſtempers. There are now living in this Town and Neighbourhood, five or ſix Perſons, who undoubtedly had that Diſtemper after taking the foreſaid Method to infect themſelves; one of whom, a young Woman, aged 23, told me, that about 8 or 9 Years ago, in order to infect herſelf, ſhe held 20 pocky Scabs (taken from one towards the latter end of the Diſtemper) in the hollow of her Hand, a conſiderable time; that about 10 or 12 Days afterwards ſhe ſickened, and had upwards of 30 large Puſtules in her Face, and other *Continued by the ſame.* No. 375. *p.* 254.

Parts;

Parts; and that ſhe has ſince freely converſed with ſuch as have had the Small Pox on them.

To make it appear, that Inoculation is a ſufficient Preſervative againſt receiving the Small Pox a ſecond time; about ſix Weeks ago, I cauſed my two Boys, who had been inoculated this laſt Summer, not only to ſee, but even to handle a Child, dying of a moſt malignant ſort of Small Pox; who, notwithſtanding, continue in perfect Health.

Upon a very exact Inquiry I find, that out of 227, who have had the Small Pox in the natural way, in this Town and a neighbouring Pariſh, ſince the beginning of *June* laſt, 52 have died.

P. S. A Perſon about ſix Miles off, cauſed his Son, about ten Years of Age, near three Weeks ago, to buy (as he termed it) the Small-Pox. Carefully viewing the Boy, I found him recovering from the diſtinct Kind of that Diſtemper, having not had, as I could perceive, above 40 pretty large Puſtules, which were then drying off.

Of the ſame. By Mr Rich. Wright, *Surgeon at* Haverford Weſt, No. 375. *p.* 267.

10. I find buying the Small Pox to be a common Practice, and of very long ſtanding; being aſſured by Perſons of unqueſtionable Veracity, and of advanced Age, that they have had the Small Pox communicated to themſelves this way, when about 16 or 17 Years of Age, they then being very capable of diſtinguiſhing that Diſtemper from any other; and that they have parted with the Matter contained in the Puſtules to others, producing the ſame Effects. There are two large Villages in this County, near the Harbour of *Milford*, more famous for this Cuſtom than any other, namely, *St Iſhmael's* and *Marloes*. The old Inhabitants of thoſe Villages, (with which they abound, being in a healthful Situation) ſay, that it has been a common Practice with them, Time out of Mind; and what was more remarkable, one *William Allen* of *St Iſhmael's*, 90 Years of Age, (who died about ſix Months ago, or thereabouts) declared to ſome Perſons of good Senſe and Integrity, that this Practice was uſed all his Time; that he very well remembered his Mother's telling him, that it was a common Practice all her Time, and that ſhe got the Small Pox that way. Theſe, together with the many other Informations I have met with from almoſt all Parts of the County, confirm me in the Belief of it's being a very antient and frequent Practice among the common People; and to prove that this Method is ſtill continued among us, I will give you the Relation of an elderly Woman, a Midwife, whoſe Name is *Joan Jones*, aged 70 Years, of good Credit, and perfect Memory. She ſolemnly declares, that about 54 Years ago, having then the Small Pox, one *Margaret Brown* (to the beſt of her remembrance then about 12 or 13 years of Age) bought the Small Pox of her; that the ſaid *Margaret Brown* was ſeized with the Small Pox a few Days afterwards; that ſhe had not had the Small Pox a ſecond time, a twelve-Month ago, and ſhe verily believes, that ſhe has not

had

had them ſince. She farther ſays, that ſhe has known this way of procuring the Small-Pox practiſed from time to time, above 50 Years; that it has been lately uſed in her Neighbourhood, and that ſhe knows but of one dying of the ſaid Diſtemper, when communicated after the Method aforeſaid, which Accident happened within theſe 2 Years laſt paſt; the Perſon who miſcarried, (a young Woman about 20 Years of Age) having procured the Diſtemper from a Man then dying of a very malignant Small-Pox. The above Relation I heard the old Woman declare 2 Days ago, and ſhe was willing to take her Oath of it before a Magiſtrate. As to the manner of communicating the infectious Matter to the Blood, by ſcraping the Skin thin with a Penknife, and ſo rubbing in the Matter, that was only the Caſe of one particular Gentleman, Mr *Owen*,, whom I heard ſeveral times poſitively affirm, that he bought the Small-Pox when at School, and of ſuch a Lady now living, and gave her 3 Pence for the Matter cotained in 12 Puſtules. That hundreds in this Country have had the Small-Pox this way is certain; and it cannot produce one ſingle Inſtance of their ever having them a ſecond time.

Concerning the Effects of the Inoculation.-By Mr Thomas Robie, *Phyſician in* New-England. No. 382. *p.* 67.

11. We do not as yet ſee any ill Effects of Inoculation, but the Inoculated are as yet as well, and ſome of them a great deal better than ever; as for the ill Conſequences that have been in *England*, I cannot tell what they may raiſe from, but I can hardly think they are the genuine Effects of Inoculation, but may ariſe from ſome previous Diſpoſition to ſuch Diſtempers as you mention, or for want of due Evacuations after Inoculation, and too ſoon healing the Places of Inciſion; but I dare not pretend to ſay any more, and ſo leave it to the Opinion of better Judges; but only aſſure you I do not know, as yet of any ſuch ill Effects in this Country.

A remarkable Inſtance of the Infection of the Small Pox. By Dr Jurin, *Soc. Reg. Secret.* No. 373. *p.* 191.

12. A young Gentleman ill of the Small Pox, of that Sort which is called the *Cohærent*, or the middle between the diſtinct and the confluent Kind, on *Wedneſday Octob.* 3d 1722, being the ſixth Day from the Eruption, grew delirious in the Night, and got out of Bed in ſpite of the Oppoſition of two Nurſes that attended him; and ſeizing one of his Nurſes by the Neck with his bare Arms, he preſſed her Forehead againſt his naked Breaſt, then covered with the Small Pox in the State of Maturation, and held her for ſome time in that Poſture. She was heated by ſtriving with him, and in ſtruggling to get looſe, ſhe was ſenſible that ſhe bruiſed and broke ſome of the Puſtules with her Forehead. The Woman was about 40 Years of Age, of a clear, florid, ſanguine Complexion; ſhe told me ſhe had had the Small Pox, when ſhe was about 7 or 8 Years of Age, and had been pretty full of them, but I ſaw no Marks upon her Face. On *Friday* Morning the Small Pox began to appear upon her Forehead, and increaſed by degrees to between 50 and 60: ſhe had likewiſe a ſmall Number of Puſtules upon the back part and ſides of her Neck, where the Gentleman had graſped her with his naked Arms; but had none,

as ſhe told me, upon any other Part of her Body. The lower Part of her Face was perfectly clear, and thoſe upon her Forehead were chiefly confined to the middle and moſt prominent part of it, which had been preſſed againſt the Gentleman's Breaſt. They roſe gradually, and came to Maturity, in rhe ſame manner as the Small Pox of the milder coherent Kind uſe to do, with a great Inflammation and Swelling of her Forehèad, and the adjoining Part of her Face, and eſpecially between the Eye-brows, where a ſmall Cluſter of the Puſtules were ſeated, inſomuch that on *Tueſday* the 9th of *October*, her right Eye was quite cloſed up, and the left almoſt in the ſame condition; but all this time ſhe had no Fever, Sickneſs, or other Symptom of the Small Pox, beſide this Eruption, and the Inflammation, and Pain that attended it. That Night ſhe cauſed a Bliſter to be applied to her Neck, upon which ſhe recovered the Sight of her Eye the next Day, being the ſixth from the Eruption, when the Puſtules were turning, and beginning to ſcab. The Scabs agreed with thoſe of the milder coherent Small Pox in their Appearance and Duration. I ſaw her hitherto every Day, as likewiſe at ſeveral times after this, and particularly on *Monday Octob.* 22d, which was the 18th Day from the Eruption of the Puſtules, when ſhe had ſtill ſome ſmall part of the Scabs remaining upon her Forehead.

In this Inſtance it is worthy of Remark: 1ſt, That this Woman, though, ſhe had had the Small Pox before, was yet infected again by the immediate and cloſe Application of the variolous Matter to her Skin, when her Body was heated with Exerciſe. Which ſeems to prove, that ſuch an Application is more effectual to give the Infection than the bare morbid *Effluvia*, ariſing from the Body of the ſick Perſon, and received into the ſound one by Inſpiration; for, that ſhe received no Infection by Inſpiration, is plain, from the appearing of the Small Pox upon thoſe Parts only where there had been ſuch an Application and Contact. From which it appears very probable, that a Perſon who has already had the Small Pox, as the Man inoculated by Mr *Tanner* in St *Thomas*'s Hoſpital, may poſſibly receive it again in ſome ſlight Degree by Inoculation; that being ſtill a more cloſe and immediate Application of the variolous Matter to the Blood, and Juices of the ſound Perſon, than when it is applied only by Contact to the Skin whole and unwounded.

2dly, That the Infection communicated to this Woman not being univerſal, as appears from her having no Fever, or Sickneſs, or general Eruption of the Puſtules all over her Body, but only on the Parts infected by immediate Contact, no Argument can be drawn from hence, for a Perſon's being liable to undergo the Small Pox a ſecond time, ſo as to have the uſual Symptoms of that Diſeaſe, and a general Eruption of the Puſtules; but rather the contrary.

3dly, That the time in which this Infection ſhewed itſelf, by the appearance of the Puſtules, is very different from that obſerved upon

Inoculation; the firſt appearing in about a Day and an half; whereas in the latter Caſe, the Eruption generally ſhews itſelf on the tenth Day, or not above a Day ſooner or later, as appears from the accurate and curious Obſervations of Dr *Nettleton*. Which difference is what ought in reaſon to be expected, ſince in one Caſe the Infection went no further than the Parts affected by immediate Contact; whereas in the other it muſt be propagated through the Maſs of Blood to all Parts of the Body.

13. The Small Pox were preceded by the uſual Symptoms of that Diſtemper; but the Pains of the Limbs, and Back, were generally more ſevere than common, as were likewiſe the *Nauſea* and vomiting. Abundance were ſeized with violent Colic Pains, which would leave them upon the Eruption, or after a Clyſter or two, with a gentle Anodyne: The Stools were commonly bilious. It ſometimes happened, that the Symptoms would not ſeem very ſevere before, and at the Eruption; and yet the Pox would prove very confluent and fatal at the State. The Puſtules were very ſmall, and did not regularly fill; but in a Day or two after the Eruption, would flat and be depreſſed in the middle. I obſerved this, even in the diſtinct Kind. In ſome Perſons they appeared in leſs than 24 Hours from the Seizure: When they broke out ſo very ſoon, they were always of the Flux Kind, as is commonly obſerved. The Eruption was attended with prodigious Sneezing, eſpecially in Children. I ſaw one * Child about 5 Years old, that ſneezed inceſſantly for more than 30 Hours, nor could it be allayed but by Anodynes. This Child had the *Confluent Pox*, and died the 13th Day. In ſome, at, and after the Appearance of the Puſtules, they would itch moſt intolerably: This happened alſo to the Child now mentioned, and was generally a bad Symptom; as it was an Argument of the great Acrimony of the morbific Matter. In ſome few, a Day or two after the Eruption ſeemed to be compleated, there would appear in the Interſtices of the Pox ſeveral miliary Puſtules, ſome of a dark red, others filled with a limpid *Serum:* Theſe never came to Suppuration, as the ſecondary Crop of Small Pox, which I have now and then obſerved ſometimes do; nor were they as large. Though this is an ill Symptom in general, yet, in a † Girl of ſeven Years old, I perceived her Fever and *Dilirium* go totally off upon this Eruption, and the Urine immediately ſettled. Some had abundance of Purple *Petechiæ* appear among the Pox at the Eruption, and the Puſtules would look of a lurid Hue: In others, the Purples would not diſcover themſelves, till the Maturation. I knew but ‖ one Perſon that had theſe Spots, during this Conſtitution, that ſurvived the Diſtemper; but ſome died the 5th or 6th Day, ſome dwindled on till the 10th or 11th. During the Suppuration, the Pox would become very ſeſſile, and the coherent

An Account of the Anomalous Epidemic *Small Pox, beginning at* Plymouth *in* Auguſt 1724, *and continuing to* June 1725. *By* J. Huxham *M. D.* No. 390. *p.* 379.

* Mr *Cockey*'s Child. † Miſs *Spurrel* ‖ Mr *Lang*'s Son.

Kind would enlarge their Baſes exceedingly; ſo that, though they ſeemed for ſome time after the Eruption to be very diſtinct, they would now flux together. A Purple Speck would often appear in the Center of the Puſtules, which would ſpread and grow blacker and blacker by degrees. The Interſtices would alſo ſometimes turn pale, ſometimes livid. Symptoms of very ill Omen! The Puſtules, that had not the Purple Speck, did not incruſt yellow, but appeared of a dead aſh Colour, and by degrees grew into a dark black Cruſt.

The Salivation, which conſtantly ought to accompany the Maturation in the confluent Small Pox, was in ſeveral very inconſiderable, in ſome none at all, ſaving a very ſmall quantity of extremely viſcid Matter, which was got off by ſyringing. I had two adult Perſons, and ſome Children, labouring under the confluent Sort, who neither ſalivated, nor purged, except when ſome lenient Cathartics were given them; and yet they got over the Diſtemper. Indeed, it was very rare, that we ſhould find Children have that gentle *Diarrhœa*, which *Sydenham*, and others juſtly reckon, ſupplies the Salivation in Perſons of more advanced Age. Some very young Children, on the contrary, drivelled exceedingly through the Courſe of the Diſtemper. In * two Children, one of 5, the other of 7 Years old, no Salivation came on till after the 13th Day, and then it was ſo profuſe, and continued ſo long, that it was with Difficulty I put a Stop to it by Purges firſt, and then by the Bark, Aſtringents, *&c.* To the younger of theſe, indeed, I had given Calomel, Gr. iv, but it was ſoon purged off. Where the Swelling of the Face and Throat was very hard, painful, and tenſe, with a ſtrong Vibration of the carotid Arteries, and little or no Salivation, the Patients generally grew delirous at the State. Theſe Symptoms frequently proved fatal. The maxillary and parotid Glands, of thoſe that recovered, would remain ſwoln, and indurated for a conſiderable time after the intire Deſquammation of the Pox, (though that was very ſlow) nor would theſe Tumours go off, but after repeated Purging, and that with Calomel, *&c.* Thoſe Tumours were undoubtedly the Conſequence of a very viſcid Matter obſtructing thoſe Glands, which hardened the Swelling of the Face, hindered the Salivation, and in ſome Meaſure, the Circulation through the external Carotids; by which Means, more Blood being forced through the Internal, an Inflammation of the Brain, and a *Delirium* might be partly brought on; and this happening too, when the Blood was fraught with acrimonious Matter abſorbed from the Puſtules, rendered the *Delirium*, at that *Stadium* of the Diſeaſe, vaſtly more to be dreaded than in the *Apparatus*, when it happened almoſt of courſe. Under theſe Circumſtances, Bleeding, emollient Clyſters, Eccoprotics, plentiful Dilution, were abſolutely

* Mr. *Wallis*'s little Boy, Mr. *Collier*'s Daughter.

neceſſary.

neceſſary. On this Occaſion, it may be asked, whether or no, the Salivation being very viſcid and defective, the Tumour of the Face hard and tenſe, ſome Mercurial (as a duly prepared Calomel) might not be given with Advantage, even in the State of Maturation? (I have frequently given Cinnabar to good Purpoſe). There are ſome Inſtances that would ſeem to juſtify ſuch a Practice; and I know but one material Objection to it, and that is, that the Weight of the Mercury would, by encreaſing the Moment of Motion of the Blood augment the Fever; but ſurely we have given Calomel after the Incruſtation, when the ſecondary Fever hath ſubſiſted without any manner of ill Conſequence, I might ſay, with great Succeſs. Nothing ſo certainly fuſeth viſcous tough Humours, being joined with plentiful diluting Liquors, as this, and ſo prepares them to be diſcharged by proper Outlets. As to *Oxymel Scillit.* Syringing, and the like, in a defective Salivation; the former, indeed, by Puking, ſometimes irritates the Glands of the *Membrana Schneideriana* to diſcharge their Contents; Syringing barely deterges the Mouths of the *Ductus Salivares*: Either have little certain Effect further; whereas the viſcous obſtructing Matter is lodged in the inmoſt Glands, and even in the Blood itſelf. This Method ſeems peculiarly adapted to ſuch an Epidemic Small Pox, as I am now deſcribing, in which we had all the Indications imaginable of a very viſcid State of Humours. The Blood, when drawn, was always exceſſively viſcous, eſpecially at the State of the Diſeaſe: Frequently there was little or no Salivation; generally it was extremely gluttinous, ſo that the Nurſes were many times obliged to pull the Matter out of the Patient's Mouth with their Fingers; and without drinking very plentifully, it would ſoon ceaſe. A *Diarrhœa* very ſeldom happened to Children. The Bliſters ſoon dried up. I heard of no one, during this Conſtitution, that made bloody Urine. Where that dreadful Symptom happened, the *Craſis* of the Blood ſeems to be diſſolved, (as *Lyſter* well obſerves); on the contrary, the recited Symptoms argued a too compact and viſcous *Diatheſis* of the Blood. The State of the Humours, during this Conſtitution, might, in part, at leaſt, depend on the extraordinary Drineſs of the Seaſon, and the almoſt conſtant Northerly and Eaſterly Winds, which we had in the Months of *October*, *November*, *February* and *March* laſt. From the middle of *January* to the middle of *April*, was a drier Seaſon than ever was known in this Country, where we have certainly, in general, more continued Rain than in moſt Places in *England*, *Plymouth*, being infamous for wet Weather.

This remarkable Change of the Temperature of the Air muſt undoubtedly have ſome conſiderable Effect on human Bodies: A very cold Wind ſuffering only the thinner Part of the Blood to paſs off by Perſpiration: Nor, in ſuch Seaſons, doth the Body imbibe ſo much of a diluting Humidity from the Air (as *Keil* obſerves). Hence the Neceſſity of drinking plentifully of thin diluting Liquors, which,

as

as it is always proper in this Diſtemper, ſo, when it happens in ſuch a Seaſon, is highly neceſſary. And I am of Opinion, M. *Andry*'s Method of bathing in warm Water and Milk, or warm Milk, before the Eruption, may, upon many Accounts, be proper in ſuch a Conſtitution of the Air. There can be no Objection againſt it, but it's not being in faſhion. I took particular Notice, that while, and juſt after the Eaſterly Winds blew exceſſively ſtrong for ſeven or eight Days together in the Months of *Octob.* and *Nov.* the Patients I then ſaw in the *Small-Pox*, ſcarce ſalivated at all. Then particularly, *an *adult* Perſon, who had the *confluent Pox* very ſeverely, did not ſpit the leaſt thro' the whole Courſe of the Diſeaſe: She was ſeized with a violent Pleuriſy the 18th Day, but was relieved by Bleeding. The Blood was the moſt viſcid that ever I ſaw. It is remarked by *Lanciſi*, that People expectorate very little in Diſorders of the Breaſt, when cold, dry, Eaſterly Winds blow; and it is what I have frequently obſerved: And this may be one Reaſon, why ſome *Aſthmatics* generally ſuffer a *Paroxyſm* at ſuch Seaſons. The Swelling of the Hands did not ſo regularly ſucceed the *Detumeſcence* of the Face, during this Conſtitution, as I have obſerved in other Epidemic Small-Pox. Some had very ſmall, or rather no Tumours at all. It was very rare the Legs and Feet ſwelled, till after the Patients ſat up, and then they had much Pain in the Parts. I have often reflected upon it, whether the Succeſſion of the Tumours in the Hands, to that of the Face, might not partly depend on the later Inflammation and Suppuration of the Puſtules of thoſe Parts: The Pain and Inflammation being a *Stimulus* determining the Humours to the pained Part: And it is particularly to be obſerved, that the greateſt Pain of the Hands and Arms commonly happens at the Time, when the Salivation begins to ceaſe: So that the Tumour of the Hands may, in ſome meaſure, prove a *Succedaneum* to the Spitting. It is the common Obſervation, that the Puſtules of the Arms and Hands inflame and maturate a Day or two later than thoſe of the Face, and thoſe of the Legs and Feet lateſt, which may alſo be the Reaſon, that the Tumour of the Legs ſucceeds that of the Hands. I have been the rather incllined to this Opinion; inaſmuch as I have ſometimes obſerved a conſiderable Swelling of the Hands (the Puſtules being very painful and inflamed) and that too in the diſtinct kind, when there hath been little or none in the Face. Generally the more painful a Boil is, the greater the Tumour around it; and by conſequence, the Tumour of a Part is in proportion to the Painfulneſs of the Boils, and their Number. From this, I would enforce the Uſe of Epiſpaſtics applied above the Wriſts, a little before the Time we expect the Tumour of the Hands ſhould ariſe (eſpecially when Symptoms are threatning) as they are *ſtimuli* to be depended on, not only attenuating and deriving the Hu-

* *Betty Boddy.*

mours

mours to the Parts, but alſo diſcharging them, and ſo proving a convenient Outlet to the morbific Matter, which before was thrown off by the (now partly ſuppreſſed) Salivation. Bliſters applied to the Neck frequently relieve the extreme Pain of the Throat, and difficulty of ſwallowing, which ſometimes are exceeding troubleſome to the Patient in the third *Stadium* of the Small-Pox, by drawing the Humours another Way. Nay, in ſome, where Veſicatories have been early applied, and continued to run extremely, there hath been leſs Swelling and leſs Salivation, than ſeemed proportionate to the Vehemence of the Diſtemper, but without any Diſadvantage to the Patients; the Running of the Bliſter ſupplying the Defect of the Spitting. It ſeems then but reaſonable, when we expect the Tranſlation of the noxious Humour to the Hands, which is what Nature itſelf affects, to endeavour to promote it's Flux thither, and give it vent. How advantageous Diſcharges of this nature may be, I had occaſion ſome Years ſince to obſerve in the Caſe of a Lady, for whom I was concerned, together with Dr *Seymour* of this Town; where, thro' the prodigious Diſcharge of Bliſters applied to her Neck, Ears and Arms; as likewiſe a plentiful Flux of Urine, ſhe neither ſwelled nor ſalivated, thro' the whole Courſe of a very dangerous, *confluent Small-Pox*, and yet recovered. Any Perſon, that hath been converſant in Practice, cannot but have obſerved Tranſlations of the morbid Matter from one Part to another ſometimes of the greateſt Service, eſpecially where it hath had a Diſcharge. (Indeed, all critical Evacuations are of this Nature). But I mean, how often hath a Boil, an Impoſthume, or ſwelling of the Limbs, been the evident Means of terminating a Fever? This I experienced particularly in myſelf, ſeveral Years ſince at *Paris*; when labouring under a violent, inflammatory Fever with *Delirium*, the 9th Day towards Night, I was ſeized with exceſſive Pain in my Arms and Hands; upon whch I bathed my Hands a long time in warm Water by perſuaſion of two worthy Gentlemen of the Faculty, now living, who were then my Fellow-ſtudents, and watched by me. In a little time my Hands began to ſwell, and in 4 or 5 hours my Delirium and Fever went off intirely, tho' my Hands remained ſwoln and pained for ſome time. If Nature, therefore, in ſome Caſes, take ſuch extraordinary Methods to free herſelf from Diſeaſes, how intent ought we to be in promoting her Operations, in a Diſtemper, where the *Metaſtaſis* of the morbific Matter to the Hands and Feet is generally regular and ſalutary. It is, undoubtedly, upon this View that *Baglivi* orders Sponges ſoaked in a warm emollient Decoction, to be applied to the Hands and Feet in the Small-Pox: And this, he ſaith, he hath done with great Succeſs. I have ſeen no leſs from Bliſters maturely applied to the Arms and Legs; but then I ordered the Patients to drink plentifully of a thin Whey or the like, which takes off, in great meaſure, the Acrimony of the *Cantharides*. Before I conclude this Paragraph, I cannot but obſerve,

ſerve, that the Delirium, attending the Eruption of the Small-Pox, is very much alleviated by the Application of emollient Cataplaſms to the Feet, in Children eſpecially. It is indeed what I do commonly of courſe apply, when I am conſulted at the beginning of the Diſtemper, and I think have had reaſon to imagine, in many Caſes, that it hath been a Means of deriving the variolous Matter that way; and, by making the Eruptions more copious in the lower Parts, the Face and Breaſt have ſuffered leſs than, I had reaſon to fear, otherwiſe might have happened. The great Tenderneſs of the Feet, which happens after their Application, is a trifling Diſadvantage, in compariſon of the Benefit may be received by them; and ſo are thoſe ſhooting Pains, which often affect the Legs on the Uſe of thoſe Cataplaſms: Not to ſay, that theſe are rather an Argument of the Benefit ariſing from their Uſe.

In the *confluent* Kind, generally a *Micturition* and *Dyſury* came on about the 12th or 13th Day, and that when there were no Bliſters applied. If a large Quantity of turbid Urine followed, it was ſoon ſucceeded by Urine, which depoſed a very large Sediment; but if it proved thin and limpid, and in ſmall Quantity, a *Delirium*, *Tremor*, *Subſultus Tendinum*, and other convulſive Symptoms, ſoon followed. There were no Symptoms ſo certainly fatal at the Turn of theſe Small-Pox, as a Delirium, and (what is, I think, of conſtant ill Omen in all kinds of eruptive Fevers at the State) a *Dyſpnœa* or the *Anheloſa Reſpiratio*: If we bled upon the firſt Appearance of them, we frequently ſaved our Patient; the Omiſſion of which a few Hours made the Caſe irrecoverable. It was very common in Perſons afflicted with theſe *Pox*, that 8 or 10 Puſtules would run together, and form a large Veſication full of a limpid, crude Matter, which would continue ſo ſeveral Days after the Incruſtation. * In one that died, I ſaw Mortifications under theſe Bladders. I thought it neceſſary to let out this Matter with a Lancet or Needle, as ſoon as poſſible, leſt it ſhould, (as it did when left to itſelf) cauſe an Ulceration; and I could not but believe it proper, inaſmuch as the Thinneſs of the Matter rendered it capable of being abſorbed into the Maſs of Blood, and that the longer it lay, the more acrimonious it would grow, it not admitting of Concoction. In two Patients, I ſaw ſeveral of the Puſtules filled with a bloody *Sanies*: I was ſurpriſed to find † one of them get ſo eaſily over the Diſtemper, tho' ſhe laboured alſo under the Flux-kind. The Deſquammation was very ſlow, the black Cruſts adhering ſeveral Days, nay Weeks, after the Turn, while abundance of purulent Matter gleeted from under them. Theſe left very ugly *Cicatrices*. No Application ſeemed to me to have a better Effect, in this Caſe, than frequently fomenting the Parts with warm Milk, or Milk and Water; this diluted the acrid Salts, waſhed them off, and

* Miſs *Booſe*. † Mr. *Baſs*'s Child.

ſoftened the Skin : Oily Liniments, by ſtopping the Pores, are frequently hurtful. In a Caſe or two I obſerved a Repullulation of Puſtules under the Cruſts in the Face and Hands, when thrown off. This particularly in the Boy, that recovered with purple Spots. The latter were diſtinct, tho' the former were in the greateſt degree confluent. Nothing ſo certainly abated, and took off the ſecondary Fever after bleeding, (if indicated) as gentle Carthartics ; ſuch as *Rhubarb*, *Manna*, *Tartar*, *Infuſ. Senn.* and the like. The hot, ſcammoniate, aloetic Purgers ſeem not ſo proper, at leaſt, to begin with. Theſe I gave the 10th, 11th, 12th or 13th Days, if I found the Patient have a quick Pulſe, feveriſh Heat, dry Tongue, Head-ach, reſtleſs Anxiety, and other Symptoms of the putrid Fever. Some one, or other of theſe, being once or twice repeated, I gave Calomel, and purged it off. This was our general Method, and the moſt ſucceſsful. I cannot but think the World highly obliged to the moſt learned Dr *Friend*, and the other noble Ornaments of our Faculty, that have introduced, and writ in Favour of, this Method. In the beginning of my Practice, relying upon the Authority of *Morton*, I gave the Cortex to check the ſecondary Fever ; eſpecially when I found it (as is very frequent) evidently intermit ; but I cannot ſay with a Succeſs any way anſwering my Expectation : Not but that after due purging, the *Bark* is very proper to extinguiſh the hectical Diſpoſition of the Blood, which is frequently the Conſequence of the *Small-Pox*, to which, if a cool Regimen, and Aſſes Milk (where no *Idioſyncracy* forbids it) be ſubjoined, we have done, perhaps, as much as lies in the Power of Phyſic. By this Method of early purging, in the *coherent* and *confluent Pox*, I have ſeen ſeveral reſcued from the moſt imminent Danger, whoſe Recovery looked rather like a Reſurrection. This, ſurely, is the only way of cleanſing the *Primæ Viæ* ſtuffed with a Load of fœtid, acrid Impurities thrown off by the Glands of the Guts, which cannot be ſuppoſed to ceaſe from their Office, during the Courſe of this Diſtemper : And foraſmuch as the Pores of the Skin are at this time very much conſtipated by the incruſted Puſtules, it is reaſonable to believe, the Glands of the Guts rather ſeparate more than uſual ; it being an allowed Maxim in Phyſic, That the leſſening one Evacuation is the Increaſe of another ; eſpecially where there is ſuch a peculiar Conſent, as between the Skin and the Guts. If ſo, the Excrement being retained for a Week, or more, by it's Weight preſſing on the great Artery, hinders the Blood from paſſing freely to the lower Parts, and ſo deluges the Brain. Hence thoſe *Deliriums*, *Coma's*, *&c.* ſo frequently threatening at this *Stadium* of the Diſeaſe. Further, can we imagine that the putrid Recrement of the now putrid Blood, joined, perhaps, with the Pus of the internal Pox, and having alſo the Addition of ſome part of the morbific Matter ſeparated by the Glands of the *Fauces*, which is accidentally ſwallowed, muſt not be greatly hurtful, by

remaining in the Inteſtines? where growing more and more acrimonious, (as is the Nature even of our moſt balſamic Juices, when they are *extra Aream Circulationis*, and expoſed to the conſtant Heat of the Body) it contaminates the Chyle, or Liquors, that are drunk, is reabſorbed into the Maſs of Blood, and becomes a *Pabulum* to the very Fever, which Nature endeavours, even this way, partly at leaſt, to throw off. And, in very deed, what horribly offenſive, fetid, large Stools do we obſerve in this Diſtemper on the Uſe of Clyſters, and more eſpecially after a Purgative? I mean at the State, or in the Declination: So that this very putrid Matter lying long in the Guts, and growing more and more ſo, becomes at laſt ſo virulent, as to corrode them, and brings on that very *Diarrhœa*, or Dyſentery, which, it is ſo vainly feared, would ariſe from a gentle Cathartic; ſeeing we are always able to check it's Force (if need be) with an Opiate, *&c.* How often do we find feveriſh hectic Heats proceed from a *Cacochymy* of the firſt Paſſages, in Children eſpecially; In which Caſe, a little Rhubarb, or a few gentle ſtomachic Purgers, ſhall do more to remove the feveriſh Diſpoſition than a Pound of the Cortex. Indeed, it is common enough to find the Bark itſelf purge gently upon it's firſt Adminiſtration: And I am confident, in ſome Caſes, it hath the better effect. Have not we ſeen ſome Intermittents cured by one ſeaſonable Vomit? And that not barely by the Shock and Agitation given to the Blood-Veſſels, *Genus Nervoſum*, *&c.* and ſo acting as an Attenuant; but by throwing off the *Saburra* from the Stomach, which fed the feveriſh *Paroxyſms:* And this is more particularly evident in the Fever frequently ſupervening a Surfeit. Hence it is, that a ſmall Quantity of the Bark ſometimes does more after a Vomit, than a much greater could before it. Why, therefore, when there is a Lodgment of putrid Matter in the *Primæ Viæ*, which, in part, at leaſt, feeds the ſecondary Fever, ſhould not we attempt to carry it off by either gentle Vomiting or Purging, as may be judged moſt convenient? It hath, and may be objected to this Practice, that it tends to draw the noxious Humours from the Circumference to the Center; but to this it hath been anſwered, that the Purging is more eſpecially pleaded for, when the Incruſtation is begun, and the Matter too thick to be abſorbed. If Nature, neither by her own Effort, nor the Help of Art, is capable of keeping the morbific Matter from falling on the more vital Parts; but by an unfortunate Tranſlation of it, is like to ſink under it's Weight: As upon a ſudden Retroceſſion of the Tumour of the Face and Hands; a premature Suppreſſion of the Salivation, or the like: Doth it not ſeem neceſſary to endeavour to carry off the offending Matter by ſome other Outlet? As, in the preſent Caſe, by the Guts, which are much more eaſily ſollicited to a Diſcharge, than either the Pores of the Skin, the urinary Paſſes, or the ſalivary Ducts. Indeed, when the Salivation of courſe ceaſes, (in my Opinion) it ſeems neceſſary to promote

promote ſome other Evacuation in it's room. At the ſame time, Cardiac or Alexipharmic Medicines are in no wiſe contraindicated by this Method (if judged needful). This way Nature affects in Children, to whom a gentle *Diarrhœa* is commonly of the greateſt Service, as proving a happy Subſtitute to the Salivation in elder Perſons. The following Hiſtory will evince, how neceſſary it may be ſometimes to evacuate an offending acrimonious Matter lodged in the Guts, and that too even in the midſt of the Suppuration. I had under my Care a * Perſon about 30, ill of the Small-Pox. It happened, that the 4th Day from the Eruption, he was ſeized with a violent bilious Cholic, to which he had been formerly ſubject: This threw him into the utmoſt Agony. His Pox flatted and grew pale, as likewiſe the *Interſtices*: His Pulſe was extreme languid, and he had a prodigious *Tremor*, with clammy Sweats. I ordered him two Clyſters to be thrown up; one as ſoon as the other was rendered: Theſe gave him five large bilious Stools: After the third Stool, he was tolerably eaſy: However, I ordered him *Laudan. Solid.* Gr. 1ſs. *Croc. Anglic.* Gr. iv. *Theriac. Andromach.* 3ſs. 4^{tis}, *vel* 6^{tis} *horis*, to be waſhed down with a teſtaceous Julep. He took the *Laudan.* three times, and ſlept ſound all Night. The next Morning, I found the Puſtules round, florid and turgid. The Man got over the Diſtemper, tho' he relapſed into his Colic ſome Days after the Turn, which upon purging with *Calomel*, *&c.* and the Uſe of *Opiates*, ſoon left him. This Perſon, before, and at the Eruption, complained of a great Difficulty of Breathing, with a ſhort importunate Cough, and a violent Pain under his *Sternum*; for which Reaſon I ordered ℥xvj. of Blood to be drawn, which was very ſizy.

The major part of the *adult* Perſons, that had the Unhappineſs to be ſeized with this Diſtemper, died; among whom fell an old Gentlewoman of 72; a very uncommon Exit for a Perſon of her Years!

It was a remarkable Inſtance of the extraordinary Virulence of theſe *Small-Pox*, that the Women (tho' they had had the *Small-Pox* before, and ſome very ſeverely too) who conſtantly attended thoſe ill of the confluent kind, whether Children, or grown Perſons, had generally ſeveral Puſtules broke out on their Face, Hands and Breaſt, exactly reſembling the pocky Puſtules, which undoubtedly aroſe from the Matter of the cruſhed Pox infecting the Skin in thoſe Parts. Thoſe Puſtules aroſe, maturated, and ſcabbed off, intirely like the true Pox. † I knew one Woman, that had more than 40 on one ſide of her Face and Breaſt; the Child ſhe attended, frequently leaning on thoſe Parts on that Side. I obſerved, that thoſe, which had the tendereſt Skins, and who attended thoſe ill of the worſt Sort, had moſt of theſe Eruptions. We had abundance of Inſtances of this Nature.

* *Tho. Hodge.* † Mr. *Hickes*'s Nurſe.

In the beginning of this Conſtitution, the *Small Pox* were much more malignant than they have been for this Month or two laſt paſt. Indeed, when they raged moſt ſeverely, ſome Children had them very favourably, and required no other Phyſic than to be duly purged after them.

An Account of the Condition of the Town of Haſtings, *after it had been viſited by the Small-Pox; by Mr* T. Frewen. N° 419. p. 108.

14. The following is a true Account of the preſent * Condition of the Town of *Haſtings*; after it's having been viſited with the *Small-Pox*; which continued there about a Year and a half. I ſhould here inſert an Account of thoſe inoculated, if any thing remarkable had happened: I can only ſay this, that they all had the Diſtemper very favourably, and continue perfectly well.

The Number of thoſe that recovered of the *Small-Pox*, (including 4 that were inoculated)	608
Died of it	97
Eſcaped it	206
Died of other Illneſſes ſince the *Small-Pox* raged there	50
The whole Number of Inhabitants in that Town are	1636
Males—	782
Females—	854

N. B. *There is, at preſent, no* Small-Pox *in that Town.*

Concerning the Efficacy of Camphire in Maniacal Diſorders; by Dr David Kinneir, *Coll. Med.* Edinb. *Soc.* N° 400. P. 347.

XIII. A Gentlewoman of 19 Years of Age, from an obſtinate faſting for 2 Days, and Averſion to ſee Company, in a religious Turn before *Eaſter*, fell into a deep Melancholy, would not talk, nor anſwer any Queſtion for ſome time, but moaned and ſighed continually, ſlept very little for 10 Days. This happened in the decline of the Moon. The Night before the Change ſhe ſpoke, and called for ſome Water to drink; which being given her, ſhe immediately fell a ſtarting and laughing, and her Eyes got a Briſkneſs in them ſomewhat uncommon, (as her Relations told me); then ſhe began to talk wildly, and continued ſo all that Night: She became next Morning very furious; whereupon a Phyſician was called, who bled her 4 times a Week the firſt 14 Days, vomited her, purged her, uſed the Cold Bath, and many other Methods common in ſuch Caſes, all to no purpoſe. In this Condition ſhe continned for 9 Months; then I was applied to.

I firſt began her with an Antimonial Vomit, which had no other Effect than that of ſetting her faſt aſleep for 12 Hours. Next Day I gave her 3ſs of *Camphire* in a Bolus, and as much at Night. She continued to reſt well all that Night, and had a great Moiſtneſs all over her Body, and in the Day-time a plentiful Diſcharge by Urine. Thus for 4 Days I plied her, and afterwards, in the Day-time, I ordered her Pills of *Æthiops*, *Gum-guaiac. Cinnab. Antim. & Pulv. de Gutteta*; and at Night, the Doſe of *Camphire*. Senſible Alterations

* *Jan.* 28, 1731.

every

every Day for the better, and in three Weeks time ſhe enjoyed the full Uſe of her Reaſon, and, tho' 9 Years ago, at this time is in a good State of Health, having no extraordinary Ailing ever ſince.

A Gentleman of a good Family, aged 17 Years, (from ſome Diſappointment) became very ſilly and ſtupid. He continued in that way for a long time, notwithſtanding he had the beſt Advice. He had a great Inclination to chaw and eat every thing that came in his way, be it what it would. He reſted pretty well a Nights, and was delighted with the Sight of every glaring Object. He hid every thing that he could lay his Hands on, as well in Company as alone, and not any ways ill-natured. Thus for half a Year he continued, when he became ſo furious, that two Men could hardly hold him from beating every body that came about him. Thus he would continue for 3 or 4 Days together, without ſleeping; then he would become calmer, after having ſlept ſome time; but was a little miſchievous. This was the way from New Moon till the Full; then he became ſilly and melancholy, ſpeaking little, and looking always down, not caring to look one in the Face. So it was alternately for 14 Months.

When I came to him, I found him full of Complaints of his ill Treatment; and had not I had a watchful Eye upon him, I had ſuffered from a Blow intended at me; but I got him to take the Medicines as before, and with allowing him a more plentiful Diet, and a great quantity of diluting Drinks, he became perfectly well in 6 Weeks, and has enjoyed a good State of Health and ſound Judgment theſe ſeveral Years, and is now in Buſineſs.

A Mercer's Wife of 36 Years of Age, having born 4 Children, and who was naturally of a lively, active Diſpoſition, fell ſo ill all of a ſudden, one Day at Sermon, that with much ado they could get her out of Church with common Decency. She tore every thing about her, talked much, and uttered horrid Oaths. In fine, ſhe was as much diſordered as you can imagine any one. She had the beſt Advice, it was thought, that *Edinburgh* could give her. They failed of Succeſs, and left off viſiting her. About half a Year thereafter I was conſulted about her. I treated her in the foregoing manner, and in 4 Days there was a ſenſible Alteration for the better, and in 4 more ſhe went abroad. I ſtill continued the Uſe of Medicines for 14 Days after Recovery, and now ſhe is as well as ever ſhe was in her Life.

A young Man, aged twenty, of a full Habit, was ſo very bad in the ſullen, deſpairing way, wounding himſelf with his Teeth and Hands, that there was a neceſſity of cloſe watching him. I vomited him twice, gave him ſome other things common in ſuch Caſes; then began him with the Camphire, which in 10 Days brought him to Reaſon. He relapſed after that on the Change of the Moon, was ill for 3 Days, but not ſo as before. He came out of it again, and ſtood the Change of the next Moon with only a little Heavineſs, as

in the Hypo. At the Height of the ſame Moon, the Day before, he was very uneaſy, and ſeemed to reſemble a Perſon greatly *hypochondriac.* I ſtill continued to him the *Camphire*, and the other alterative Medicines, for ſome time, but in a much ſmaller Doſe than what I gave him in his Illneſs: So in 9 Weeks he was perfectly cured, and continues in good Health.

Concerning the Cauſes of the Gout, by Sig. Michele Pinelli; *tranſlated from the* Italian *by* Joh. James Scheuchzer, *M. D. F. R. S.* N° 403. p. 491.

XIV. I have found by chymical Proceſſes, that the ſolid Subſtance of human Bones, and the circumambient Parts, is compoſed of Phlegm, Oil, an alcaline volatile Salt, and a little Earth. The ſame Principles I have alſo conſtantly diſcovered in the Blood, and all the other Fluids, which are ſecreted from it, as well as the other ſolid Parts, with this difference only, that there is more Phlegm, and leſs Oil and volatile Salt in the Fluids, than may be extracted from the Solids. Carrying theſe Experiments ſtill further, and endeavouring to extract *viâ humidâ*, as the Chymiſts call it, the Salt from the Excrements in the Stomach and Inteſtines, I have conſtantly found a Salt not unlike Sea-ſalt, and appearing upon Examination to be a perfect Acid. And yet, with all poſſible Art and Carefulneſs whatever, nothing of this acid Salt could ever be obtained from all the other ſolid or fluid Parts of the Body. Hence it appears how much thoſe muſt be miſtaken, who have hitherto aſſerted, that the Cauſe of the Gout is a coagulating Acid exiſting in the Blood, ſince nothing of an Acid is found in any part of the Body, but the Excrements. This put me upon thinking, that the Cauſe of the Gout may be owing, perhaps, to that other ſaline Principle which chymical Trials ſhew us to exiſt both in the ſolid and fluid Parts: And I have been confirmed herein by the following Experiments.

A very gouty Perſon being lately dead at *Rome*, I procured as much as I could of that tophaceous gouty Subſtance commonly found about the Joints of Perſons afflicted with this Diſtemper: And having got about three Ounces and a half, I took ſix Glaſs-bottles, and put ten Grains of it into each. The firſt of theſe Bottles I filled with diſtilled Vinegar, the ſecond with Spirit of Vitriol, the third with Spirit of Salt, the fourth with Spirit of Sal-ammoniac, the fifth with Spirit of Hartſhorn, and the ſixth with Spirit of Urine. After four and twenty Hours, I found the aforeſaid tophaceous Matter totally diſſolved in the three firſt Bottles, which contained the acid Spirits; but in the three others, which I filled with alcaline Spirits, it remained entire and untouched, even for ſome time after. From hence I concluded this tophaceous Matter to be of an alcaline Nature, foraſmuch as it is the Nature of acid Spirits, to diſſolve ſuch Subſtances as are either altogether alcaline, or compoſed in part of an Alkali. And this alſo I conceived to be the Reaſon why the aforeſaid tophaceous Subſtance remained entire in the Bottles filled with alcaline Spirits, both being of the ſame Nature, and conſeqently not to be diſſolved by each other.

But

But for a farther Satisfaction, I took the remaining part of this tophaceous Matter, being about ℥iij, and put it into a ſmall Retort. Then having fixed a Recipient to it, I diſtilled it, according to the Rules of Art, by a gradual Fire, and obtained a Spirit, with ſome few Drops of Oil, about ℥ij. of a *Caput Mortuum* remaining in the Retort. This Spirit I found to be a perfect volatile Alcali, altogether of the ſame Nature with that which is extracted from Blood, from Urine, and from Bones. Hence again it is evident, that this tophaceous gouty Subſtance is compoſed of the ſame Principles with the other fluid and ſolid Parts of the human Body; or, that the Cauſe of the Gout is nothing elſe but a volatile, alcaline, corroſive Salt, which by corroding the ſenſible Membranes about the Joints, occaſions thoſe acute Pains, which we call the Gout.

Of the Uſe of cold Water in Fevers; by Nicholas Cyrillus, *Prim. Med. Prof. Neapol. F. R. S.* N° 410. p. 142.

XV. Uſus Frigidae & Frigidorum in Febribus haud recens eſt, ſed apud antiquiſſimos Medicos minimè infrequens fuit. In Febribus enim calidioribus, poſt Paroxyſmi ἀκμὴν, liberaliorem Aquae, vel cujuſpiam refrigerantis liquoris potationem concedebant, quâ defervescente febrili aeſtu, aeger placidè conquieſcens in criticum ſaepenumerò ſudorem exſolveretur. Verùm Febres curare *ſolâ nivatâ Aquâ* copioſiſſimè per plures dies exhibitâ, omni ſubtracto medicamento alimentoque, id quidem omninò novum exiſtimo; atque non ſolum inſolenter, ſed, ut verum fatear, audacter nimis, non multis ab hinc annis hîc tentatum, methodo, ut rumor fuit, ab Hiſpaniâ, rudi & indigeſto Commentariolo communicatâ: quâ curandi ratione nonnullos ex ipſis Orci faucibus, praeter omnem expectationem, ereptos ſub oculis noſtris attoniti vidimus. Haeſere primùm cauti Medici tantâ Aquae alluvie perterriti: at frequenti feliciſſimoque eventu excitati, tentabundi primùm, mox audaciores facti, quod quidam coeco impetu, & nullo morbi, morbique temporum diſcrimine aggrediebantur, ad cautiorem & ſecuriorem methodum redegere: ita ut nullus jam apud nos ſit Medicus, qui Cleophantus δοσίψυχος (ut notat Harduinus in Plinium, lib. 26.) appellari nolit. Hujus Methodi Canones repetitis experimentis confirmatos exponam. Magnum enim remedium eſt Diaeta Aquea, (hoc nomine appellare libuit) quare in illius adminiſtratione, quemadmodùm in omnium magnorum remediorum uſu, accuratiſſimis cautionibus procedendum, ne quod pro Ægrotantis ſalute inſtituitur, illius potius necem moliatur.

Praecipuus Canon eſt, ut poſt aliquot horarum à cibo abſtinentiam, Ventriculo ſcilicet omninò vacuo, Aqua nive refrigerata ebibi incipiat, ad libram unam vel duas, pro Ægrotantis aetate, viribus, aut etiam ſiti. Eadem copia ſingulis horis, aut ſecundâ quâque, aut tardius, repetenda, eademque noctu diuque, nullâ factâ intermiſſione niſi per ſubrepentem fortaſsè ſomnum, exhibeatur. A cibo omninò abſtinere debent Ægrotantes: Experientiâ enim conſtitit, illum cum Aquâ copioſâ permiſtum, non ſolùm in Ventriculo putredinem concipere, verùm etiam ab eodem epotae Aquae ſubſtantiam infici, eamque

que minùs aptam reddi, quae facilè exiliſſima vaſcula permeare, adeoque in extima ſimul & intima corporis disjici ac diffundi poſſit, ad praecipitationem & ſecretionem noxiorum humorum moliendam. Inedia haec ad plures dies producenda, quouſque ſcilicet Febris vel prorſus intermiſerit, vel ad ſummam remiſſionem devenerit, atque Æger identidem de fame conqueri incipiat: ſi enim maturiùs exhibeatur Cibus, ſtatim Febris ſuis ſtipata Symptomatibus iterum recrudeſcet. Quapropter nonnunquam ad ſeptem, imò ad decem & plures dies (dummodò ab Aquâ non abſtineatur) Ægrotantes ab omni alimento prohibemus. Neque ab hâc abſtinentiâ quidquam metuendum: vel quòd ob Aqua frigiditatem, arctioribus redditis cutis ſpiraculis, Tranſpiratio inſenſibilis, adeoque nutritionis neceſſitas imminuatur; vel quòd Aqua ipſa Nutrimenti Officinas aſſiduò praeterfluens, ſi quae inibi ſunt alimentorum reliquiae (ſunt autem ſemper impactae) eas ſecum rapiat, atque per univerſum corpus diffundens, nutricationis negotio, quoad fieri poteſt, conſulat. Quomodocumque autem ſe res habeat, illud quotidianâ praxi confirmatum eſt, Cibum cum copiosâ Aquâ commiſceri, abſque ſummo Ægri periculo, non poſſe: ita ut quamprimùm Cibus Ægrotanti conceditur, ille vel abſque Potu, vel cum exiguâ Aquae potatione exhibendus: imò concedendum quoque eſt aliquot horarum intervallum à Frigidae potu vacuum, quo commodè Cibus in Ventriculo digeri queat.

Hic ſeligendus tenuiſſimus & εὐπεπτος, ut Panis purâ Aquâ coctus, Paſtilli de micâ Panis, Ovum ſorbile, vel vix ferculum aliquod jurulentum. Haec ſemel primùm & pauciſſima, hinc bis in die exhibenda, ut ſenſim ad lautiuſculum prandium, ſervatâ tamen exiguâ coenâ, gradum faciamus: omninò verò, etiam per menſem & ultrà, carnibus parcendum. Cum hujus generis Cibo veſcuntur Ægri, haud Aquae valedicendum, ſed peractâ illius aſſumti digeſtione, ad duas vel tres potationes erunt cogendi: quouſque integrè devicto morbo, corporis vires ſenſim recuperantes, ad diu exoptatam convaleſcentiam perducantur.

In hujus autem Curationis curriculo quaedam accuratè animadvertenda ſunt. Principem locum tenet Obſervatio, num Aqua aſſumta facilem ſibi tranſitum paret, an non. Cum Urinae, ſaltem poſt diei intervallum, copioſiores & decolores ſenſim fieri incipiunt; tunc Aquam viam ſibi facere coepiſſe puta. Nonnunquam primâ ſtatim die vel ſecundâ tertiâve, Alvus ſolvitur, cum ejectione primùm faeculentioris ſaburrae, mox variegatorum humorum: hinc ſpes major affulget; Febris enim, Alvo ſolutâ, ſenſim ſe remitti, atque ſymptomata ſedari incipiunt. Quod adeò verum eſt, ut ſi ſecundus vel tertius dies excurrat, abſque eo quod ventre ſecedant Ægri, etiamſi univerſa fortè Aquae quantitas per Urinae vias foras amandetur; Clyſteribus tamen ſuppoſitis, & Oleo Amygdalarum dulcium per os aſſumto, lubrici reddendi: craſſiores enim humores, qui in primis viis continentur, quique Febrim fovent, vel in Febricitantium corporibus ex

Morbo

Morbo produci ſolent, haud poſſunt per caeca Urinae ſecernicula foras protrudi, ſed per amplos Inteſtinorum tubos ſunt eliminandi. Adde, quòd exantlatis primis ductibus, facilè poterit Aqua in ultimos Corporis receſſus trajici, atque Sanguini, aliiſque ſecundariis dictis liquoribus medicinam facere.

Si verò accidat (accidit autem ſaepè) ut Parotides appareant, vel cum ipſis Alvi vel Urinae excrementis purulentum quid intermiſtum obſervetur, quod evidens indicium eſt maturi & rupti jam Abſceſsûs; haud ab Aquae exhibitione ſurperſedendum, ſed eâdem urgendum magis eſt. Una enim Aqua, quae ſtagnantes in internis partibus humores ad externas depellere, Collectos ad maturationem perducere potuit, vim quoque habebit eoſdem per varia Corporis ſecernicula integrè deturbandi, atque partes Abſceſſu prehenſas à *necroſi* praeſervandi: quemadmodum ſaepiſſimè in Praxi vidimus. Praxis tamen eadem nos docuit, abſceſſus in Cerebro & Thorace factos non adeò facilè Aquaeuſu ſuperatos eſſe: etſi non paucos vidimus, Pure è naribus, auribus, ore, & tuſſi quoque è pulmonibus educto, integrè ſanatos. Solemus proinde cùm talium ſymptomatum ſigna ſuperveniunt, haud Aquae praeſidium reſpuere; ſed ſi ſomnolenti evadant Ægri, Veſicantia, vel aliud Phaenigmatum genus applicare: aut ſi difficultate ſpirandi exerceantur, Oleum ex Amygdalis dulcibus recens expreſſum propinare, vel Aquam ipſam ex frigidâ tepidiuſculam reddere. Non rarò inſuper accidit, ut primis praeſertim Aqueae diaetae diebus, vomitus, & quidem vehemens, ſuperveniat: quo ſi heterogenei humores, ut fieri ſolet, ejiciantur, pro bono habendum; ceſſat enim cum Ægrotantis levamine, poſtquàm ventriculus omninò exoneratus ſit. Quòd ſi Aqua ipſa vix epota evomatur, ad iteratas & frequentiores potationes Æger cogendus: etenim Aquam vomitu rejectam maligni humores ſubſequi ſolent. Conſtanter item & aſſiduò Aqua eſt exhibenda, ſi Singultus ſuboriatur: hunc enim quemadmodum ab Aquâ excitatum, ita ab Aquâ continenter epotâ compeſci obſervamus. Sudor verò ſi Frigidam potanti ſuperveniat, ſolet vires exſolvere, non ſine magno vitæ diſcrimine: Id quidem paradoxon videri poterit iis, qui ex Frigidae in Febribus potu ſudorem expectant, in quo magnum D. *Hancock Febrifugum* conſiſtere ſcimus. At in diaetae Aquae uſu, ſi ſudor ſuperveniat, is cohibendus, Aquâ adhuc frigidiori & copioſiori exhibitâ, Ægrique corpus remotis ſtragulis, ventilabro, & perflatu conclavis refrigerandum: ſunt qui & nive ipſa contritâ conſpergere audent.

Maxima porrò in Aquae uſu Medicorum crux eſt, cùm Ægri vel delirio, vel Lethargo, vel ſummâ virium abjectione affecti, ad Aquam juſtâ copiâ & frequentiâ bibendam impares redduntur. Tunc quidem omnis adhibenda eſt induſtria, ut poſtremum quod illis reſtat remedium, nempe Aqua, exhibeatur: Quod à delirantibus vi & minis, à valdè debilibus & conſopitis Nive in os intrusâ, per fas & nefas, nonnunquam extorſimus.

Poſt expoſitam Aqueae diaetae methodum, & quomodò ſymptomatibus ἐπιφαινόμενοις occurrendum ſit, reliquum eſt, ut quibus in Febribus, & quo illarum tempore ad hoc praeſidium deveniendum ſit, exponamus. In principio ſanè Univerſali Febrium haud opportunum eſt ſtatim Aquam arripere: quum enim tunc temporis cruda & craſſa ſint omnia, haud jure ſperes à copiosâ Aquâ peccantes humores poſſe vel ſecerni vel exturbari. Secùs in Morbi ſtatu cùm omnia exacerbata ſunt, & ἡ νόσος ἀνθεῖ, ut ait *Hippocrates* cùm nempe Æger ad maximum periculum perductus eſt, Aquae praeſidium opportunum locum habet: tunc enim materia Febrim fovens ex diutinâ ebullitione, particularum contritionem quandam, vel, ſi mavis, aliqualem coctionis umbram adepta, poterit copioſae Aquae exhibitione, illiuſque cum humoribus corporis permiſtione veluti praecipitari, ſecerni, atque quâ data porta evacuari. Hinc igitur ſaepe accidiſſe vidimus, ut fortunatiùs evaſerint, qui in ipſo veluti mortis agone conſtituti ad hoc extremum praeſidium, tanquam ad ſacram anchoram confugêre. Hoc monitum negligentes audaculi quidam Medici, Aquam in Febrium principio, vel incremento exhibentes, in maxima pericula, & mortem ipſam, Ægros deduxere. Non inficias tamen iverim, in Febribus Biliosis, ſeu tenues humores pro cauſa agnoſcentibus, non infelici auſu, Aquam quandoque in ipſo principio exhibitam eſſe: & ratio ex ſuprà dictis evidentiſſima eſt.

In Febribus igitur Acutis, Malignis, & lethalibus omnis generis, quo tempore opportunum videbitur, quod à maximo Ægri periculo ſignificari ſolet, ad diaetam Aqueam deveniendum. Nam vel Febres tales ſunt, ex quibus ad concretionem tendit ſanguis; & tunc Aquâ copiosâ cum eo permiſtâ facilè poterit fluidam naturam ferè amiſſam iterum recuperare: Vel ex Febre ſanguinis maſſa ad nimiam tenuitatem, cum ſpirituum exſolutione vergit; atque hoc caſu Aqua, praeſertim frigida, ſalia acria ſanguinem diſſolventia ſolvere & retundere potis erit. Unde Phaenomeno lux, cur ſcilicet frigidum jam redditum Febricitantis Corpus ex frigidae potatione veluti miraculo incaleſcat. Sive enim ſanguis ex pernicioſo ſpirituum effluxu concreſcere incipiat, ſive ex nimiâ illius diſſolutione ſpiritus evolent; ſemper frigidae copia cum illo permiſta (accedente quoque pororum cutis conſtrictione) aeque ſpirituum diſſipationem prohibebit, adeoque Calor amiſſus revocabitur.

Hinc illud hic inculcandum, quod à principio inſinuavimus, Aquam non niſi nivatam Febricitantibus praeſcribendam: primùm enim frigidâ ſe eâ copiâ ingurgitant Ægri, quae operi neceſſaria eſt, calidam verò reſpuere poſt primas potationes ſolent: praetereà ab Aquae frigiditate Ventriculi Fibris vis major elaſtica accedit, quâ propelli in ulteriores vias uſque ad ſanguinem ea facilè poſſit; contrà tepeſcens fibras eaſdem ad atoniam diſponens, ſui mole ventriculum inflat, pondere premit ac anxium reddit.

Haud tamen diſſimulabimus, nos quandoque non frigidam, ſed calentem Aquam praeſcribere: cùm ſcilicet Pulmonum & Viſcerum Inflammationes & dolores cum Febribus copulantur: veriti ne frigidum partes phlogoſi prehenſas ad πέπανσιν diſponat. Verùm negare minimè poſſumus in his caſibus nonnunquam ad frigidiuſculam, etſi non nivatam, tranſitum fieri: cùm nempe, tepentis Aquae faſtidio affecti Ægrotantes, illam aſſiduò bibere renuunt. Satius enim eſſe reputamus, multam frigidiuſculam, quàm paucam tepentem, ſed operi imparem miniſtrare.

Juxtà hos canones (quos Experimenta ſaepiùs inſtituta, & Ratio poſtmodùm, ſi non invicta, ſaltem non omninò infirma ſuaſit) Diaetâ Aqueâ in Febribus multoties uſi, felices eventus notavimus, ut ἄριστον μὲν ὕδωρ verè fateremur. Nonnunquam tamen praeconceptâ ſpe fruſtrati ſumus, quod à Medicinae fortunâ praeſertim in magnorum Medicamentorum adminiſtratione, non abhorret: nil enim adeò certum in illa eſt, quod fallere etiam accuratiſſimos Practicos ſaepè non poſſit.

Hucuſque de Frigidae uſu in Febribus locuti ſumus: verumtamen ſunt & alii Morbi, in quibus Aqueam diaetam, & non ſine Ægrorum emolumento, analogiſmo quodam ducti tentavimus. Tales ſunt Diarrhoea, Dyſenteria, imò & Coeliaca, & Lienterica affectio: tales ſunt Iſchuria Renalis & Dyſuria: tales Cardialgia & Cholera Morbus Hypochondriaca & Hyſterica affectio: nec caremus exemplis Hydropis (quis credat?) copioſâ Aquâ epotâ curati: reſeratis nempe coecis Renum & Alvi viis è quibus & Aqua & ſeroſus latex ubertim efflux-it. Imò & ſalutarem Aqueae Diaetae uſum experti ſumus in Variolis, ſed in tertio illarum ſtadio, ad necem Ægris tendentibus, ex Abſceſſibus in cerebro & Pectore formatis: quo remedio ingentem puris copiam naribus & ore excerni vidimus. Haud tamen in omnibus his Morbis Aqueam Diaetam, hoc eſt, Aquam ſolam, omni interdicto Cibo, adhibemus; ſed in Chronicis, largâ frigidae potatione 4 horis ante parcum prandium, atque altera 8 horis à prandio, contenti eſſe ſolemus.

Haec quidem ſufficere putavi ad meum propoſitum: unum tamen poſtremò animadvertendum apprimè eſſe duco, quoad Aquae frigidae exhibendae copiam; gravius ſcilicet delinqui, ſi minori quantitate propinetur, quàm ſi excedenti. Quum enim eo fine Febricitantibus in valde ancipiti ſtatu conſtitutis Aqua exhibeatur, ut in omne Corpus diffuſa, meatus referet, liquoribus motum & tenuitatem naturalem impertiatur, ac membrorum omnium calorem roburque foveat; id praeſtituros nos fruſtrà pollicebimur, modicam propinantes Aquae quantitatem, quae in Ventriculo & primis Viſceribus moram trahens, tantum abeſt ut poſſit ulterius progredi, ut potius cum noxiis humoribus ibi ſtagnantibus permiſta, illorum putrefactionem promoveat, Ægroque perniciem moliatur. Opus igitur eſt, ut maximâ quantitate & ſucceſſivè ingeratur, ad hoc ut copiâ viam ſibi paret, & veluti

alluvie Corpus universum inundet. Id autem eò audentiùs prosequendum, si post primam transactam diem, transitûs Aquae signa per Urinam vel alvum apparuerint. Eô enim Aquam reliquis Remediis securitate praestare putamus, quòd tametsi nonnulla Medicamenta possent fortasse maximos Morbos debellare si excedenti dosi exhiberentur, veluti stibium Diaphoreticum, Bezoarticum, & sal volatile quodcumque, & ipsum Vinum generosum copiosè epotum; verumtamen quis non videt, ex ipsâ excedenti dosi maximum vitae periculum, debilibus praesertim Ægrotantibus, imminere? sola Aqua innocentissima & tutissima videtur: vix enim Æger est adeò viribus destitutus, qui uberrimam Aquae copiam sustinere non valeat. Hinc haud παρὰ μήθοδον factum puto, si etiam cùm desperata res est, & jam conclamatum, Medicus facto prognostico, & expositâ quidlibet audendi occasione, Aqueam Diaetam, etsi contraindicatum remedium, si non praecipiat, saltem permittat: nonnunquam enim improvisis Naturae Modis, desperatos jam Ægros ex insperato ad salutem redisse vidimus: ut pro sano consilio illud habendum sit, satius esse anceps remedium experiri, quàm nullum.

Haec sunt quae apud nostrates de Aquae in Morbis usu experiri usu venit, quo nullum familiarius per vulgi ora nunc fertur Ægritudinum omnium remedium: ut nostris his temporibus aptari commodè possit Versiculus, quem de *Euripide* à ventris cruciatibus, ope Clysteris maris Aqua parati, liberato, refert *Laërtius:*

Ἡ θάλασσα κλύσει πάντα τῶν ἀνθρώπων κακά.

An simile accidere possit in frigidioribus Regionibus (de quo haud desperem, nam etiam hybernâ tempestate tales per Frigidam Curationes hîc feliciter prosequimur) videant accuratissimi Viri, qui in Boreis Terrae plagis, non sine maxima laude & fortuna faciunt Medicinam.

Intermitting Fevers cured. By the Rev. Mr Tho. Shaw. N°. 411. *p.* 183.

XVI. We have a Species of the *Scabiosa* at *Algier*, which is of great Virtue in removing intermitting Fevers. I send you a Specimen of it's upper Leaves, for the lower are at present dried up. It is not unlike the Figure which *Morison* gives of his 20th Species, Cap. XXI. Sect. 6. Tab. 14, or of his 25th Species, Cap. XXI. Sect. 6. Tab. 15, of Corymbiferous Plants, only the Head is not round, as there described. I have therefore presumed to call it, *Scabiosa, flore pallido purpureo, capitulo oblongo, foliis superioribus incisis, inferioribus integris, serratis.* The Method of preparing it, is to put a handful of it into a Quart of Water, and boil it away to a Pint. A Coffee-Dish full of this Decoction is given Fasting, a little before Dinner, and at Night, to the Patient, no Regard being had to the Interval or Intermission of the Fit, as in giving the Bark; and it operates ordinarily by Stool or Urine. I have only seen this Plant here, at *Oran*, *Gibraltar*, and Mount *Libanus*, where I first was acquainted with it's extraordinary Qualities.

Concerning the Difficulty of curing Fluxes, by William Cockburn, *M D. F. R. S.* No. 425. p. 385.

XVII. In reading Dr *de Juſſieu*'s Memoir, about the preſent Diſgrace of *Ipecacuanha* in *France*, and the Method he propoſes for redreſſing it's Defects by *Simarouba*, a Root brought from *Cayen* in *America*, I was ſurprized to find a Remedy almoſt adored for half a Century, to have fallen into the utmoſt Contempt ; a *Specific*, a very ſhort and ſatisfactory Word, totally neglected by it's moſt zealous Votaries. The learned Profeſſor alledges, that this great Revolution, in the Fame of *Ipecacuanha*, proceeds from it's having been unſkilfully adminiſtred : Phyſicians commonly conſidering the general Appearance of a Looſeneſs only, without penetrating into the particular Cauſes which ſupport it, and require, on that account, different Methods of curing it. M. *de Juſſieu*, avoiding all Extremes, is an Enemy to the baniſhing *Ipecacuanha* altogether out of the Practice of Phyſic, as many of it's diſappointed Adorers now do ; becauſe it is not the infallible Specific they vainly imagined it to be.

This common Miſapplication of Medicines, or our Ignorance of the particular Circumſtances of a Diſeaſe, when it requires a different Method of Cure, is the very Reaſon why great Numbers of excellent Medicines among ancient Phyſicians, have been loſt, becauſe they were not underſtood. Take a broken Shin for inſtance, which has the Skin only rubbed off, obſerve the Difficulty the beſt and honeſteſt Surgeons have to cure it. Go to *Aetius*, and others, where you may find a *ſafe*, *eaſy*, and *ſpeedy* Cure ; which, as the ſame Author on another Occaſion obſerves, the People make ſlight of, becauſe they do not know the Danger or Trouble that often attend it.

A *Looſeneſs* is more liable to be miſtaken than the greateſt Number of other Diſeaſes ; becauſe it is produced by two immediate Cauſes that are very different, when the reſt have one Cauſe only, however great the Diverſity of particular Caſes may appear to be. A Fever, *viz.* has but one Cauſe, tho' the Variety of Fevers, or the various Appearances of a Fever are infinite, and never can be claſſed by Obſervation, I ſhall therefore conſider the different Circumſtances of a Looſeneſs obſerved by Dr *de Juſſieu*, and that occaſions the Miſapplication of *Ipecacuanha* ; but I ſhall afterwards endeavour to make his Account more perfect ; for thereby Phyſicians will be able to have more perfect Intentions and Views of curing than hitherto they have had.

When great Crudities, ſays the Doctor, *and indigeſted Stuff in the firſt Paſſages, or an Obſtruction in the Bowels of the lower Belly are the Cauſe of a Looſeneſs, we may always expect the common good Effects of the* Ipecacuanha *for a Cure. On the contrary, when* Ipecacuanha *is given againſt a Hepatic Dyſentery, or againſt a great Diſcharge of Blood upwards or downwards, often occaſioned by a purging Medicine that was given for a Cure of the Looſeneſs, no Succeſs can reaſonably be expected from the Specific, far leſs have we any Hopes, when* Ipecacuanha *is given for the Cure of a Looſeneſs that ſubſiſts on an Inflammation of the lower Belly ; or when ſharp and fixed*

fixed Pains give us a Suspicion that the Dysentery has a cancerous Ulcer for it's Cause.

As there is no Difficulty that is peculiar to a *Dysentery*, and is not common with the Dangers of a Diarrhœa, the Terror of Blood not excepted, it must be acknowledged that any Vomit as well as *Ipecacuanha*, is a proper Cure against ill Digestions and Crudities in the Stomach, as *Hippocrates* anciently observed, and has been believed by all Physicians since his Time: So that there is nothing in the *French* Specific that is not in Salt of Vitriol; which we find held it's Reputation, in curing *Dysenteries*, longer than *Ipecacuanha* is like to do.

It is more wonderful that this way of curing a Looseness by *Ipecacuanha* was not sooner determined. Nothing besides the lazy Talk of a Specific, that excludes all Reasoning and Reflection, could have made Men easy under so gross Ignorance. The very Instance given us by the late excellent Dr *Tournefort*, in the Case of his Tutor *Petrus Sylvanus*, is a sufficient Proof that *Ipecacuanha* is no Charm of a Specific, but that it cures by it's evacuating: For, when the Weakness of *Sylvanus* made them cautious in administring the Specific, the Disease held it's Ground against the Charm, and it's Adorers, till Despair drove the Physician upon larger Doses, the last Resort of the Vanquished, and they produced Evacuations by Vomit and Stool, and thereby his Health in one Night.

It would be superfluous to observe upon what is said about the *Simarouba*, and how far it may remedy the Defects of *Ipecacuanha*, the Trials of it being few, not sufficient to determine the Universality of it's Use. Far less shall I enquire, whether the *West-India* Plant has any Relation to the *Macir* from the *East-Indies*, mentioned by *Pliny* *; tho' I wish Dr *de Jussieu* had prepared the *Simarouba* with Honey, since the great Cures recorded by *Pliny*, by the *Macir* might be assisted by it's being prepared in that way. I shall then proceed, and make the foregoing Account more perfect, and more obvious, better fitted to fix the Views of Physicians, in the Point they are to pursue. For this Purpose, I shall give a plain Account of the several Species of a Looseness, and in each of them apply the different kind of Remedies employed for the Cure of them. Thus we shall perceive the proper Administration for every Looseness, and how far any of them is left without a Cure.

The Anatomy of the Guts alone informs us, that the *immediate Cause of every Looseness*, whether it be Symptomatic or Essential, must either be a *quicker Conveyance of the common Quantity of concocted Food, and of the Liquors that are commonly mixed with it in the Guts. Or the Cause of a Looseness is a greater Secretion than ordinary, of a watery Substance from the Blood into the Guts, and brought into them by the* Pancreas, *and*

* Hist. Natur. lib. xii.

various

various other Glands. In both which Caſes there muſt needs be a larger Diſcharge of liquid Excrements, by Stool, than uſual, or there muſt be a Looſeneſs. A *Looſeneſs* produced by the firſt of theſe Cauſes, admits of great Variety; both on Account of the different *Stimuli*, and even from the different Degrees of the *Stimulus* in each of them. The *Stimulus*, *viz.* of indigeſted Food, Fruits, and the like, differs very much from the *Stimulus* of Gall. The firſt Sort is confined to the Stomach and Inteſtines: In which Caſe, the Diſeaſe is often a Cure to itſelf; whereas the *Stimulus* of Gall is greater, and the Cauſe is more permanent and ſeldom carries off itſelf. The Degree of the *Stimulus* may be determined by ſome other concomitant Symptoms of *Slime*, *Glair*, *&c.* But when the *Stimulus* is occaſioned by the *Piles*, an *Ulcer*, or a *Stricture* in the Guts, it is vaſtly more violent, and much departs from the common Cure of a Looſeneſs, whereby Phyſicians are often ſubjected to fatal Errors, and groſs Miſapplications of their Medicines. The *Watery Looſeneſs* produced by the other immediate Cauſe, is indeed deplorable; becauſe a Method of Curing is not commonly known. It is not only as a Principal, but it is a Second, in the Beginning, at the Ending, and in the intermediate Times of all other Diſeaſes, and even in old Age, when Nature is ſubmitting to the Power of Death; when Phyſicians call it a *Colliquative Looſeneſs*, becauſe it ſeems to melt away the Fleſh of the Sick. * *Petrus Salius Diverſus*, a moſt approved Phyſician, affirms it to be vain for a Phyſician to attempt the Cure of it. *Carolus Piſo*, who endeavours to explain it, and the moſt ſagacious *Laz. Riverius*, after trying all the common Methods, gives us no better Hopes of a Cure.

It is now manifeſt why a Looſeneſs, that in all outward Appearance is one and the ſame thing, and promiſes to ſubmit to the ſame Remedy, is vaſtly different in the manner of curing it. Our Experience has contradicted our Belief, and the Remedy that has proved effectual and ſufficient in one Caſe, has proved ineffectual and uſeleſs on other Occaſions; on which account Remedies are very liable to be miſapplied.

To prevent this Misfortune in a great meaſure for the future, I ſhall conſider the Medicines commonly made uſe of by Phyſicians for the Cure of a Looſeneſs; and next how they may moſt properly be adapted to that End: For thus we muſt perceive the particular Caſes wherein they are like to be uſeful, and when they are not like to be of any uſe at all. *Aſtringents*, or binding Medicines, were the firſt employed for the Cure of a Looſeneſs, as well as of every other Evacuation: But *Hippocrates* obſerving that a Looſeneſs was often the eaſieſt cured when it was attended with Vomiting, *Vomiting* Medicines were introduced on that account. On a like Conſideration, Purging Medicines were admitted by *Celſus*, becauſe he found the

* Pag. 188, 189. lib. de Peſte.

Purging

Purging the *Cure* of itſelf; or that the Looſeneſs went off by going to ſtool for a few Days: But he adviſes Phyſicians to take care that the Looſeneſs does not run longer than ſeven Days, and that it is not attended with a Fever; for in that caſe the Looſeneſs is not *critical* and *ſalutary*, but *ſymptomatical*, and haſtens on the Ruin of the Sick. All theſe Obſervations have not been found univerſally true in many other Countries; for *Cælius Aurelianus*, a moſt accurate Obſerver of Diſeaſes, *Rhazes* and *Avicenna* blame this free Uſe of Purging and Vomiting, and may be juſtified by what will be ſhewn in the Progreſs of this Diſcourſe. But, now that we may apply this Artillery of Phyſicians againſt the two general Cauſes of all Looſeneſſes, we ſhall begin with the moſt ancient of the mentioned Methods, which was practiſed by *Prodicus Selymbrianus*, whoſe School was adorned by the divine *Hippocrates*. Binding Medicines, as I lately obſerved, were employed for the Cure of every Evacuation, and are ſtill the Refuge of Phyſicians when all other Methods have been baffled, under their own Conduct and Direction; they tacitly have the Preference given to all other Medicines; for inſtance, *Ipecacuanha* is preferred to any other Vomit, and *Rhubarb* to any other Purge, becauſe they are more aſtringent than any other of the Tribe. So far do Phyſicians extol the Power of *Aſtringents*, that many of them affirm, that by them any Looſeneſs may be repreſſed, if they did not think it unſeaſonable or improper. However, it may ſtand with theſe Boaſters, it is very certain, that theſe Medicines only affect a Looſeneſs occaſioned by a *Stimulus*, and if this is ſmall, the Looſeneſs may be cured by it; but if the Degree of the *Stimulus* is greater, the aſtringent Medicine is either not able to put a ſtop to it, or it will tear the Sick with Gripes if it does. It is on the ſame account of the *Stimulus*, that a Vomit or a Purge is properly premiſed to other Medicines, if it conſiſts with the Strength of the Sick; but after all, the Storehouſe of Phyſicians ſeems to be exhauſted in curing a Looſeneſs that proceeds from Indigeſtion, or Gall; but if the *Stimulus* is from the Piles, an Ulcer, or a Stricture in the Guts, Phyſicians are loſt without any Remedy, and too frequently have Recourſe to the omnipotent Aſtringent, without any Succeſs. Here is a real Want, an Inability and Unſkilfulneſs in our Work, and leaves too much room for miſapplying Medicines. But if we turn theſe Engines of Vomiting, Purging and Binding, upon the other general Cauſe of a Looſeneſs, they either fall very ſhort, or like a little Water thrown upon a great Fire, they rather inflame than extinguiſh it. *Hippocrates* * indeed does not mention the *Watery Looſeneſs*, but he ſays many things that peculiarly concern it; which *Foëſius* not underſtanding, blamed him for Obſcurity in this Place. *Piſo* † gives a very plain Deſcription of this Looſeneſs, and his Obſervation is admitted by every ſucceeding Phy-

* Coac. Prænot. 134. Prædict. 81. † Sect. IV. cap. 1. Obſ. 54.

ſician.

cian. The desperate State of the *Watery Looseness* was formerly mentioned from the Confession of Authors of the greatest Knowledge and Veracity; and Physicians shall for ever find that Looseness to become more violent the more you press it with Astringents, Vomits, or purging Medicines. The boasted Omnipotency of putting a Stop to a Looseness at pleasure, must serve another Use with the Sick, tho' it may not be able to put the desired Stop to his Purging. There is even a Singularity in the Cure of this Looseness which I think has not hitherto been observed. In every other kind of Looseness the Stools acquire a Consistence, when they begin to be cured; but in the *Watery Looseness*, the Stools commonly lessen in Quantity, tho' not in their Looseness. I should say something of *Opium*, a Medicine often made use of for the Cure of every kind of Looseness, but as it neither acts as an Astringent, nor in a way observed by Physicians, it must still remain among other *Desiderata*.

XVIII. 1. This short Account of *Mortifications*, &c. which contains 48 Pages in a large 8*vo*. is divided into three Parts.

An Abstract by James Douglas, *M. D. F. R. S. of a Book, entituled*, A short Account of *Mortifications*, and of the surprising Effect of the *Bark*, in putting a Stop to their Progress, &c. *by* John Douglas, *Surgeon, F. R. S.* N° 426. p. 429.

In the first, our Author treats of *Mortifications* in general. What he says upon this Head is collected from some of the most experinced Physicians and Surgeons, who all affirm, that a Mortification from an internal Cause is always incurable; and when it proceeds from an external one, it can never be cured but by Amputation, or separating the Part affected from the sound.

In the second Part, he gives a very remarkable Observation of his own, which proves to a Demonstration, that a Gangrene, even from an ill Habit of Body, may be cured, contrary to the hitherto received Opinion.

In the third Part, he makes some Remarks on the present Case, and adds some parallel Observations from Mr *Rushworth*, a Surgeon in *Northampton*, who had the good Fortune of making the first Discovery of the great and surprising Effects of the *Peruvian Bark* in checking the Progress of *Mortifications*, which he says has been likewise confirmed by the repeated Observations of Mr Serjeant *Amyand*, who had often used the same Medicine, in the same Case, and with the same Success with Mr *Rushworth*. Our Author says further in this Place, that it is only by taking off the Fever that the *Bark* produces all these good Effects. But to return to the Observation itself, which he has given us with a great deal of Judgment and Accuracy. He says, that *April* 22, 1732, he was sent for about 15 Miles out of Town to visit a Gentleman near 50 Years of Age. Upon Examination he found the Back of his right Foot mortified, near the middle Toes, about the Breadth of a Shilling; his Pulse quick, and his Tongue dry. There being no Sign of any external Hurt, Bruise or Wound, his Physician, Apothecary, and himself were all of Opinion, that it must proceed from some internal Cause residing in the Mass of Blood. The necessary Dressings being got ready, he scarified the

mortified Part, and cut to the very Bones without being felt by the Patient, having afterwards carried his Inciſions thro' the Skin as high up as the Knee, before ever he began to complain of the leaſt Pain. His Limb was at the ſame time ſtuped with a proper warm Fomentation, and the Wounds dreſſed up, as uſual, with Pledgets dipped in hot Oil of Turpentine, and over all a Poulteſs, was laid on of *Theriac. Londin.* Oatmeal and Stale-Beer, the Phyſician preſcribing what Alexipharmics he judged moſt proper upon the Occaſion. *April* 23, Serjeant *Dickins* and Mr *Cheſelden* being called in, directed the ſame external Applications to be continued as before. *April* 24, The Mortification did not ſeem to ſpread. *April* 25, His Fever was high, his Tongue very dry, and the Mortification began to ſpread a little. He then ſcarified again, and deeper. *April* 26, The Mortification ſeemed to be at a Stand. *April* 27, The Mortification ſpread croſs the Toes towards the Ball of the Foot, which he ſcarified deeper, and dreſſed as before. The Fever grew higher. *April* 28, He was forced to uſe the actual Cautery, the Mortification getting ground in ſpite of all he had done. *April* 29, He found no Benefit from the Cautery, tho' applied wherever the Part was corrupted. *April* 30, The two Surgeons that had been conſulted before, the Phyſician, the Apothecary, and the Author, were all of Opinion, that even the taking off of the Limb could not ſave him, but that in all probability he muſt die in 24 Hours, his Symptoms being worſe than ever; that is, his Fever was very high, his Tongue dry enough to grate a Nutmeg, his Viſage wild, he had a great Drought upon him, was very reſtleſs, the Mortification ſpread as far as the *Tendo Achillis*, and beſides, the Patient complained of a Pain and Hardneſs in the ſide of his Belly. In this deplorable Condition the *Jeſuit's Bark* was propoſed by Serjeant *Dickins*, and agreed to by the other Surgeons preſent, and ℥ß. was ordered to be given that Evening, and repeated every 4 Hours. *May* 1, This Morning he found a very ſurpriſing Alteration for the better, with regard to the Fever, and the other Symptoms complained of the Day before; the Patient had a good Night's Reſt, and the Mortification had made no further Progreſs. *May* 2, There was a ſmall Diſcharge from the Sore. *May* 3, He found two large Abſceſſes on each Side of the Ancle. The Violence of the Fever being taken off by the Uſe of the Bark, Nature was unable to form theſe Abſceſſes, and from that he concluded, that the Progreſs of the Mortification was effectually ſtopped. He obſerved upon giving the *Bark* but once in 6 Hours a ſmall Return of the Fever, with a worſe Digeſtion, which obliged him to give it every 4 Hours as before, and continued in that Doſe for 28 Days in all; and then every 6 Hours for 5 or 6 Days longer, tho' the Fever had quite left him all that time. The whole Quantity of the *Bark* given to this Gentleman amounted to ℥x. *May* 5, His Pulſe was regular, and the Digeſtion plentiful and laudable. The Muſcles and Tendons

on

on the Sole of the Foot being all mortified, before the *Bark* was given, ſeparated in Proceſs of Time, and fell off very kindly, leaving the Bones of the Toes, *Metatarſus* and *Tarſus* bare and carious, which he afterwards cut off one after another, as he found occaſion, and could be done with Safety. About the middle of *November* following, the Ends of the *Tibia* and *Fibula* were almoſt covered with a firm *Cicatrix* ; the Patient at this time was well in all other reſpects, and was able to walk about by the Help of a wooden Leg, and from that time has continued in perfect Health.

Of the Uſe of the Peruvian *Bark in Mortifications; by Mr* John Shipton, *Surgeon*, N° 426. p. 434.

2. D. Ruſhworth, Chirugus Northamtonienſis, literis ad Societatem Chirurgorum Londinenſium datis, Oct. 18, 1731, ſe ad virum vocatum fuiſſe narrat, cui ſphacelus pedis ex interna cauſa cum febre vehementi & pulſu inordinato ad oſſa uſque progreſſus fuerat : atque huic primo ope ſcarificationum profundarum & uſitatorum remediorum ſphacelum cohibitum, febre leniore facta, pulſu quietiore, & pure ad margines ulceris apparente ; deinde iterum & tertio recrudeſcentem & latius ſerpentem eadem methodo reſtrictum fuiſſe ; tandem Cortice Peruviano in uſum, dum febris remitteret, vocato, febrem & ſphacelum extincta penitus fuiſſe, aegrumque crure abſciſſo ſanum & valentem multis annis vixiſſe teſtatur ; idemque ſe aliquoties ab eo tempore expertum eſſe confirmat. Literis hiſce D. Amyand, reſpondit, Jul. 29, 1732, ſe jam ad exemplum Ruſhworthi Cortice Peruviano ſepties cum ſucceſſu in ſpacelo uſum fuiſſe, & ſpeciatim in viro 78 annorum, cui ſphacelus pedis ex phlegmone obvenerat, iſque dum quotidie procederet latius, poſt 24 horas à cortice exhibito partes emortuae ſeparari, puſque laudabile apparere incipiebant : in alio item, cui ſphacelus opem remediorum vulgarium per tres ſeptimanas repudiabat ; ut & in tertio, ubi ſphacelus puncturis crurum propter hydropem factis ſuperveniens corticis vires ſenſit, malo intra diem unum cohibito, licet aeger immedicabili ictero obſeſſus, morboque & remediis exinanientibus exhauſtus, gangraena crus alterum occupante, fato ceſſit : exque his omnibus corticem Peruvianum non minus certum eſſe remedium ad ſphacelum ex cauſa interna quacunque ſanandum, vel certe ad eundem cohibendum, quam ad febres intermittentes profligandas, ſatis conſtare arbitrari ſe profitetur.

Praeter iſta notari etiam merentur literae D. Joan. Douglas Chirurgi ad eundem D. Ruſhworth, Jul. 5, 1732, miſſae (quod etiam poſtea peculiari ſcripto ad id edito fuſius proſequitur) quibus ſe ad virum quinquagenarium, ſphacelo pedis ab interna cauſa laborantem vocatum, fuiſſe refert : ubi poſtquam ſcarificationes, alexipharmaca intus & extra adhibita, aliaque uſitata praeſidia per aliquod tempus fruſtranea fuiſſent, morbo quotidie ſerpente, uſu tandem corticis Peruviani, quem D. Dickins Chirurg. Reg. cum D. Cheſelden Chirurgo in conſilium adhibitus perſuaſerat experiri, ſphaceli progreſſus ſtatim repreſſus eſt, febris mitior facta, brevique putridae

omnes partes, tendines ſcil. ligamenta, & oſſa omnia pedis, metatarſi & tarſi ſponte abſceſſerunt, aegro convaleſcente.

Haec omnia Anglice ſcripta & in unum congeſta pro benevolo ad publica commoda promovenda animo libello minuſculo incluſit, ediditque D. Ruſhworth: quae ne intercidant, & in oblivionem veniant, ut contingere iis, quae brevibus chartis deſcripta circumferuntur, vulgo ſolet, utque exteri, qui Corticis Peruviani uſum in Febribus intermittentibus ob, neſcio quae, obventura vel ſubventura mala formidant, hoc ſaltem caſu, quo nihil gravius accidere poteſt, ad eum experiundum animentur; paucis eadem complecti, & Latine exhibere, eaque quae mihi nuper in ejuſdem remedii uſu obtigerunt, ſubjungere placuit.

Ante annum fere ad virum quinquagenarium, cui ex liberaliori Bacchi uſu, indeque orta cachexia phlegmone pedis in ſphacelum digitorum & metatarſi mutata erat, vocatus ſum. Is, licet plurima alexipharmaca, aliaque ad id malum facientia, interna & externa, per plures dies a D. Dod, M. D. & Chirurgis Holloway & Green adhibita fuerant, quotidie latius & profundius ſerpſerat, cum febre potius lenta quam ullo modo vehementi & diabete ſpurio, ſeu copioſiori urinae limpidioris profluvio. Hiſce omnibus evincendis, cum praeſertim urinae quantitas aucta aſtrictorias Corticis Peruviani vires expoſcere videretur, & experimenta DD. Ruſhworth & Amyand ſucceſſum pollicerentur, ejus uſum Medico & Chirurgis tentandum propoſui: qui cum membri exſtirpationem nihil valituram ſatis ſcirent, abunde ex pluribus tentaminibus infeliciter factis edocti, aliaque fruſtra uſurpaſſent, facile manus dederunt. Is vero cum ad ℈ij. quarta quaque hora per aliquot dies datus fuiſſet, nihil aut ad diabetem, aut ad ſphacelum conferre viſus eſt; ſed per illum humido vitali exhauſto, per hunc carne continue latius abſumta, aegrotus intra duas fere ſeptimanas mortem obiit.

Feliciorem eventum nuper habuit corticis uſus in viro 35 circiter annorum, temperamenti melancholico-ſcorbutici; qui, dum ex ſclopeto aucupatorio pulverem pyrium eximeret, idque cum manus dextrae vola incautius ori ejus appoſita eſſet, diſploderetur, vulnus per mediam palmam indiciſque & pollicis intercapedinem porrectum, amplum & profundum, cum vaſorum & tendinum laceratione paſſus eſt, quod ſtatim in pago urbi propinquo, ubi tum erat, haemorrhagia largiore cohibita deligatum erat. Per aliquot dies gravis dolor cum tumore magno & inflammatione digitos omnes praeter pollicem, totamque manum & brachium obſedit, neque quicquam ex vulnere praeter ichoris copiam, primo ſanguinolenti, deinde fuſci coloris cum foetore aliquali prodiit; vulnus etiam ipſum ſubnigrum latius indies patebat, tumorque & inflammatio cum dolore vix diminutus eſt, licet uſitata ad ejuſmodi vulnera remedia uſurpata fuiſſent. Undecimo autem die ſanguis ad uncias aliquot intra ſpatium nycthemeri quater ſponte ſua fluxit, qui bis ſponte etiam ſtetit, bis autem adhibito Sp. terebinthinae manuſque preſſione reſtrictus eſt,

& margines

& margines vulneris ſphacelo conſpicuè occupari videbantur. Cum igitur nihil jam reſtare videretur praeter uſum ferri igniti ad haemorragiam ſiſtendam, ſimulque ſphaceli progreſſum cohibendum, quando illa fomenta & cataplaſmata, hic faſciarum ſtricturam repudiaret, ſin autem cauterium nihil proficeret, ad manus amputationem deveniendum eſſet, quae quam anceps in hujuſmodi corporis temperamento remedium foret, experientia ſatis teſtatur; ad utrumque pariter inhibendum Corticis Peruviani vires, cujus feliciter exhibiti teſtimonia plura tum audiveram, experiri hic etiam placuit. Duodecimo igitur die ∋ii. Corticis mane exhibiti ſunt; & quarta quaque hora repetiti; ex quo, ſequenti mane, cum jam ejus unciae dimidium hauſiſſet, dolorem plurimum mitigatum, tumoremque manus valde imminutum inveni, puris etiam aliquantum circa vulneris margines & intra faſcias conſpectum, limbuſque undique, qui pridie ex ſphacelo niger erat, jam ſeparari incipere viſus eſt: Febris quoque, quae toto prius tempore minime gravis, ſatis tamen ſenſibilis, cum haemorrhagia incrementum ſumſerat, in totùm quieverat, urina ſedimentum paucam, quod lutoſi potius aut albo flaveſcentis quam lateritii vel roſacei coloris erat, deponente. Corticis uſus eodem modo per duos dies continuatus erat, deinde per duos amplius dies ter quotidie ſumptus, tum per tres alios dies bis duntaxat in die, adeo ut intra ſeptimanam unam duae ejus unciae datae fuerant. Interea tumor & inflammatio omnis evanuerunt, pus purum manabat, caro ſuccreſcebat, & dolor, qui tamen inter movendum ſatis gravis in carpo adhuc reſtabat, plurimum imminutus fuit. Per tres deinde ſeptimanas omnia bene ſe habebant, excepto quod rheumatico-arthriticus affectus, quo alias hyeme laborare ſolebat, nunc pedem, nunc acromion & ſcapulam unam vel ambas, cum tumore, invaſit; febre interim vacuus erat, & appetitu ad ea, quae permiſſa erant, valens. Deinde vero, Dec. 19, ſtomachus imbecillior fieri, dolor metacarpi cum tumore major quae cum ſequenti die augmentum ſumere viſa eſſent, tertio die pulſus aliquantum celerior factus eſt, & tumor metacarpi cum inflammatione abſceſſum minabatur, vulnere interim palmae pus album & aequale, ut antea, fundente. Quarto autem die vulneris orae veſiculis tumidae, ad gangraenam tendere, cum copioſo ſaniei ſine ullo pure effluxu, manuſque tota & carpus tumore inflammatorio & graviſſimo dolore obſideri. Cortice igitur eodem, ut prius, modo exhibito, intra octo horas, cum vix tres ejus doſes hauſiſſet, dolor, qui antea acerbiſſimus erat, quaſi incantamento lenitus eſt, & ſequenti deligatione tumor manus dimidio ſubſediſſe, & pus laudabile manare videbatur. Urina primo ſatis intenſi erat ruboris, deinde paulatim dilutior evaſit, nullo, vel pauciſſimo ſedimento. Deinceps, ut praecaveretur recidiva, corticis unciam dimidiam ſingulis ſeptimanis ad ſextam uſque exhibui, ſcrupulis duobus per triduum bis quotidie datis, finemque quarto demum menſe laborioſae huic curationi, qua tendines omnes muſculorum perforati & perforantis, praeter eos, qui

qui minimo digito inſerviunt, abſceſſerant, os etiam unum ex iis, quae metacarpum, aliud eorum, quae carpum conſtituunt, nudatum erat, abſceſſuſque unus & alter dorſo manus orti, finem impoſui.

Ex hiſtoriis hiſce, & praeſertim, ex ultima, ſatis conſtare exiſtimo, nihil hic ſociatis aliorum medicamentorum virtutibus, nihil peculiari humorum diatheſi, aut incognitae cuidam idioſyncraſiae, nihil ſpontaneae ſymptomatum remiſſioni, nihil fortuitae Criſi, & ſalutari per alias ſecretiones expurgationi, caſui denique nihil imputandum, ſed ſucceſſum omnem corticis ſolius viribus unice tribuendum eſſe.

Licet autem in hiſtoriis memoratis corticis pulverem duntaxat ſe in uſum duxiſſe omnes referant, ſi quis tamen aut ſtomacho imbecilli conſulturus, aut ex alia ratione, ipſum ea forma exhibere refugit, vix dubitarem reſinam ejuſdem aut extractum dimidia quantitate datum eundem effectum praeſtiturum, cum ad febres intermittentes, ubi praecipua ejus virtus eniteſcit, praeparata ejuſmodi corticis idem cum ipſo valere quotidie videamus.

Quod ſi quis ex hiſtoria prima a D. Ruſhworth memorata, qui corticem, dum febris aderat continua, exhibere timuit, & remiſſionem exſpectavit, febrem intermittentem in omnibus, qui citantur, aegrotis, latuiſſe contendat, adeoque nihil eſſe miri, ſi cortex ab hoſte intra pomaeria ſua deprehenſo victoriam reportaverit ; huic reponere liceat, nihil ejuſmodi in pluribus, imo contrarium plane in quibuſdam, obſervatum, ut teſtantur ſatis idonei talium ſymptomatum judices ; in ultima autem hiſtoria, ubi ipſe, ut potui, ad omnia attentus eram, nihil me notaſſe latentis alicujus typi, aut febris praeter ſolitum, eumque lentum, tenorem obſidentis, quodque vel ad continentem aliquam, multo minus ad intermittentem pertineret, nihil febrilis in urina ſedimenti, nihil inſoliti caloris, aut ſitis, aut rigoris in una praecipue diei parte, nihil ariditatis vel nigritiei linguae confirmare poſſum ; & ſi rem vere reputemus, febrem, quaecunque aderat, ſolum fuiſſe ſymptomaticam inveniemus, quae ſecundum veterum medicorum placita (nec recentiores abnuunt, & ex re ipſa patet) intermittens eſſe nullo modo poteſt. Et quod ad hoc argumentum praecipue ſpectat, vires ſcil. corticis in ſphacelo ſiſtendo non ex febre quadam intermittente, & latente profliganda in actum duci, dum haec ſcribo, ad manus effertur ſcriptum nuper editum D. Bradley Chirurgi Londinenſis, qui eundem felicem eventum habuiſſe corticis uſum narrat in foemina cachectica & leucophlegmatica ; cui cum vulnus amplum & tranſverſum ſuperiore cruris parte ex caſu contigiſſet, tertioque die febris vehemens cum pulſu frequenti & intermittente, lingua arida & nigra, aſpectu torvo, & mente aliquatenus emota, ſuperveniſſet, gangraenaque interea totum fere crus occupaſſet, uſu corticis quarta quaque hora exhibiti intra nycthemeri ſpatium gengraenam cohibitam, aliaque ſymptomata evanuiſſe ; quinto autem die, corticis uſu intermiſſo, omnia iterum reverſa eodemque rurſus ſumpto ſedata fuiſſe, & aegrotam convaluiſſe memorat.

Ex hac hiſtoria, ut & quibuſdam è ſupra memoratis, apparet, non ſolum corticem, dum febris adeſt, exhiberi tuto & cum ſucceſſu poſſe interdum, ſed etiam febrem fortaſſe hujuſmodi ſymptomaticam non eſſe è genere putridarum vulgarium, quae etiam ideo à quibuſdam ſcriptoribus medicis ad ſuum peculiare genus refertur, vel earum, quae in intermittentes faceſſere ſperantur; cum ad eas omnes uſum corticis plerumque noxium, interdum lethalem obſervant medici, in hac autem ſalutarem fuiſſe evincunt facta à pluribus experimenta: ſed haec a Medicis ulterius expendenda.

Praeterea ex hiſtoriis allatis notari meretur, quod licet in quibuſdam proximam gangraenae cauſam vulnera dederint, in omnibus tamen primam & praecipuam ex ſtatu & conditione humorum deſumendam videri; adeoque remedia intus exhibita quam ea, quae extra applicari ſolent, citius & ſecurius ſcopum attigiſſe.

Iſtae, quas ſupra exhibui, ſunt, quantum novi, omnes, quotquot de uſu corticis ad hujuſmodi morbos hactenus editae fuerunt, obſervationes; quibus plures ſine dubio quotidie ex praxi Chirurgorum hujus Urbis (quaſdam ipſe nuper ab aliis accepi) addi poterunt; quas ſi eodem ſucceſſu probari plerumque contigerit, quid obſtat, quo minus hunc ejuſdem uſum ad periculoſiſſimum & fere immedicabilem affectum ambabus ulnis amplectamur, ejuſque repertorem omni laude & praeconio dignum judicemus?

Si ultra progredi vellem, & ad plures, quas in ſe cortex continet, virtutes digitum intendere liceret (quamvis ex eorum numero eſſe me minime optarem, qui cogitata ſua ſuſque deque per omnia verſant, & quae vigilantes ſomniant, in experimenta de vita & valetudine aliorum perduci cupiunt) cum quantum ad haemorrhagias narium, pulmonum, caeterarumque partium, per quas ſanguis è corpore eliminari poteſt, valeat, abunde Medicis notum ſit; ejuſdem etiam vires ad ſanguinis fluxum in externis vulneribus ſiſtendum, ubi ex nimia illius tenuitate aut acredine vaſa coire reſpuunt, Chirurgis ex propria experientia commendare poſſum; nec minus ad nimias excrementitiorum, vel etiam aliorum praeter ſanguinem utilium ſuccorum evacuationes eundem plurimum valere ſaepius deprehendi.

Qualem effectum praeſtare poterit mirabilis hicce cortex in ulceribus quibuſdam peſſimi moris, quae Nomae & Phagedaenae Chirurgis appellantur, & fortaſſe in herpetibus malignis, experientia deſtitutus nihil affirmare audeo; hoc tantum monuiſſe contentus, argumento ab analogia ducto, cum gangraena & ſphacelus ulcera ſint putrida & depaſcentia, illum non minus interdum fortaſſe efficere poſſe in aliis ejus generis affectibus: quod tamen non ſine praevia corporis totius cura, re & tempore plerumque id in hiſce concedente, quod in ſphacelo ſecus eſt, & reſpectu ad univerſum corpus habito, nec ſine Medici docti & prudentis conſilio aggrediendum autumarem. Atque hoc modo memorando illi Hipp. l. de Arte initio, monito obtemperare, juvabit. " Mihi vero invenire aliquid eorum, quae nondum

" inventa

" inventa ſunt, quod ipſum notum, quam occultum eſſe praeſtet, " ſcientiae votum ac opus eſſe videtur: ſimiliterque & ſemiperfecta " ad finem perducere & abſolvere. At vero verborum inhoneſto- " rum arte ad ea, quae ab aliis inventa ſunt, conſundenda promtum " eſſe, nihil quidem corrigendo, eorum vero, qui aliquid ſciunt, in- " venta apud ignaros calumniando; non ſane ſcientiae votum aut " opus eſſe videtur, ſed proditio magis naturae ſuae, & ignorantia " artis.

Ut paucis igitur abſolvam, quas ſupra attuli, hiſtoriae non otioſo- rum cerebrorum ſunt figmenta, non anicularum deliramenta, non ru- dis plebeculae jactationes, non ex hypotheſi aliqua ſtructae narrati- tiones, neque etiam Empiricorum de arcanis ſuis Venditationes; ſed plurium in arte magiſtrorum fidelis experientia; quae ab uno uno vel forte, vel induſtria, vel ingenio & ſagacitate primum excogi- tata, aliiſque in communem utilitatem tranſmiſſa, a quamplurimis ere conſentientibus minime fallax comprobata eſt: adeo ut quod hoc pacto in varia aetate, ſexu, corporis temperamento, & vitae con- ditione, valere repertum eſt, in poſterum eodem, modo valiturum vix dubitandum ſit, ſecundum veriſſimum illud Ciceronis effatum; " Opinionum commenta delet dies, naturae judicia confirmat."

The Antiquity of the Venereal Diſeaſe. By Mr. Will. Becket, F. R. S. N°. 365. p. 47.

XIX. 1. Before I engage in the principal Deſign of this Letter, which will be to prove, that the *Venereal Diſeaſe*, when it came to be confirmed, was frequently known among us ſome Hundreds of Years before the Siege of *Naples*: I ſhall endeavour to refute the Opinion of thoſe who believe it to have had it's Riſe there, if any ſuch ſhall remain, who have read over my former Letter *. True indeed it is, that there have not been wanting ſeveral Modern Authors, who have aſſerted it; but I determine to make it appear to be an Error as in- conſiderately, and haſtily received, as ſtarted by ſome Chimerical Author; who, becauſe ſeveral Writers, about that time, obſerving the Diſeaſe to begin in the *Pudenda*, ſeparated it from another, with which it was before confounded, muſt likewiſe take upon him to aſ- ſert it's being a new Diſtemper, and to aſſign a certain Time and Place for it's Riſe. Now one might with all the reaſon in the World expect, that, if the Diſeaſe had it's Original there, it muſt have been ſo certainly and infallibly known, that there could have been no uncertain Opinions about it, but that the Phyſicians, who reſided in or near the Place, and thoſe more eſpecially, who intereſted them- ſelves ſo far as to write of it, muſt have all of them, to a Man, a- greed upon the certainty of a Thing, the Knowledge of the Truth of which was ſo eaſily attainable. But on the contrary, *Nicholas Leo- nicenus*, who was the firſt *Italian* Phyſician that wrote of this Diſeaſe, and who lived at the very time when *Naples* was beſieged, is ſo far from acknowledging it to have had it's Riſe there, from the *French* Soldiers Converſation with the *Italian* Women, and ſo little did he know

* *Philoſ. Tranſ.* N°. 357.

know of it's true Cauſe, that he does not allow it to be the conſequence of impure Embraces. About this time it was likewiſe, that Pope *Alexander* VI. engaged *Jaſper Torella* to write of this Diſtemper. This Pope was in League with *Alphonſus* King of *Naples*, againſt *Charles* VIII. King of *France*, to prevent his paſſing thro' *Italy*, when he went to beſiege *Naples*; yet this Author is ſo far from allowing it to have had it's Original there; that he tells us, the Aſtrologers were of Opinion, that it proceeded from I know not what particular Conſtellations. Nor does *Sebaſtianus Aquilanus*, who lived at that time, allow it to be any other than an ancient Diſeaſe; or *Antonius Scanarolius*, who wrote in 1498, which was but 4 or 5 Years after the before-mentioned Siege. Nor do ſeveral other Authors, then living, ſay one Word about this *Neapolitan* Story. But it ſeems *Ulricus de Hutten*, a *German* Knight, who was no Phyſician, poſitively affirms this Diſeaſe to have had it's Riſe there; but how he ſhould come to know this, who lived at ſuch a Diſtance from the Place, and they, who were Phyſicians, reſiding as it were upon the Spot, be ignorant of it, will be as much credited, as his following inconſiſtent Relation, which will ſufficiently prove how little Care he took to be appriſed of the Truth of what he wrote. This very Author tells us, this Diſeaſe was unknown till the Year 1493, or thereabouts, that he himſelf had it, when he was a Child, and ſo conſequently that it was Hereditary, or from the Nurſe. He wrote his Book of this Diſtemper at *Mentz*, where it was printed by *John Scheffer* in 4*to*, in the Year 1519. Now if we allow him to be but 27 Years of Age, when he wrote, (for he cannot be ſuppoſed to be leſs, who before this, took upon him to cure his Father of the *Venereal Diſeaſe*, without the aſſiſtance of any Phyſician or Surgeon) he muſt have had the Diſtemper upon him, according to his own Account, before ever it was in Being. Thus we may ſee, how Perſons may be impoſed upon by a haſty and inconſiſtent Writer, no way qualified for ſuch an Undertaking, and greedily receive in Falſhoods inſtead of Truths, if they will not be at the pains of conſulting the Original Writings of our Predeceſſors, the only ſure Method of overthrowing ſuch chimerical and imaginary Notions.

If I have in my former ſufficiently proved, that the firſt Degree of the *Venereal Diſeaſe* was very common among us ſome hundreds of Years, before it is commonly ſaid to have been known in *Europe*, there will be no reaſon for any body to conceive we were at that time in any meaſure Strangers to it, when it came to be confirmed on them. Now when it was in this confirmed State, the Writers of thoſe early Times looked upon it as an entirely new Diſeaſe, and not a Conſequent of any Evil before contracted, becauſe they were not appriſed, that the firſt Symptoms being removed, and the Diſeaſe to Appearance cured, it ſhould afterwards diſcover itſelf in ſuch a Manner, as ſhould not ſeem to have the leaſt Analogy with the Symptoms

that firſt attacked a Part, which had been for a conſiderable time free from any Misfortune. But becauſe the Symptoms are the only true Characteriſtics, whereby we are infallibly able to know one Diſeaſe from another, it may be expected, that I produce ſufficient Authorities, to demonſtrate they were all of them known and deſcribed by ancient Phyſical and Chirurgical Writers, juſt as they appear to be in the *Venereal Diſeaſe* at this Day, if I would prove that Diſeaſe to be of a much more ancient date, than is generally thought; and if I do this, I cannot but think it will be ſatisfactory, ſince we can have no other way of coming to a Knowledge of any one Diſtemper, than by it's Symptoms. The Method of laying down the exact Succeſſion of them, will be impoſſible to be reduced to any certain and infallible Rule, there being ſo great a Variety of Cauſes, that obſtruct ſuch a Regularity; for which reaſon, I ſhall take notice of them in ſuch order as they moſt generally appear, which was upon no Account to be expected from our ancient Writers, for as much as they mention every particular Symptom by itſelf, not knowing but they were independant of each other, and that each of them was a diſtinct Diſeaſe. However, the proving thoſe Symptoms were in being in theſe early Times, will be as ſtrong an Argument to prove the Antiquity of this Diſtemper, as if they had been regiſtered in the moſt exact Order of Succeſſion, becauſe we ſhall, upon the ſtricteſt Examination find they are peculiar to the Venereal Malady only. I have, I hope, ſufficiently made it appear in my former Letter, that the firſt Degree of this Diſeaſe was anciently known among us by the Name of the *Brenning*, or *Burning*; and that it was the ſame Thing with what we now call a *Clap*. The Symptoms, which are uſually it's Concomitants, are the *Phymoſis*, and *Paraphymoſis*, both which are accurately deſcribed, and proper Remedies for them ſet down, by the before-mentioned *John Arden* Eſq; in another Manuſcript of his, curiouſly written upon Vellum, and beautifully illuminated. The imprudent Method of Cure of this firſt Degree of the Venereal Malady, is ſometimes attended with a Caruncle in the *Urethra*, which was a Diſeaſe very common among us anciently: For not to mention other early Writers, our before-mentioned Author gives us the Caſe of a certain Rector, that had ſuch a Subſtance, like a Wart, growing in the *Penis*, which in another Place, he ſays, frequently happens; and of another, which had ſuch an Excreſcence as big as a ſmall Strawberry, which (ſays he) proceeded from the corrupted Matter, which remained in the *Urethra*.

And indeed there is not any Symptom of the Venereal Diſeaſe, that I find ſo often mentioned as this of the Caruncle, inſomuch that it ſeems to have been more common in thoſe early Times, than at this Day. But this muſt be certainly owing to the ſmooth and oily Remedies they were continually injecting; which, by their relaxing and ſoftning the Fibres of the Part, muſt neceſſarily diſpoſe the Con-

texture

texture of ſmall Blood-Veſſels, lodged at the bottom of the little Ulcerations, to fill with nutritious Juices, and to extend themſelves ſo, as to form ſuch fungous Excreſcencies; and ſo ſollicitous were they to remove theſe Inconveniencies, that they made uſe of ſeveral Ways by Corroſives, and other Methods, to accompliſh this End; and a very early Writer among us, has given us a very methodical and curious Tract on this Subject, wherein he recommends the removing them by the medicated Candle, which we uſe at this Day, and lays down divers other Inſtructions, in relation to it, which makes it probably the beſt Diſcourſe on this Subject, that was ever yet written. The ſame Author takes Notice of thoſe contumacious Ulcers which happen upon the Glans, and the neighbouring Parts, which we now call Shankers; and the great Trouble our ancient Authors found in attempting their Cure, ſufficiently diſcover them to have had their Original from a Venereal Infection. Theſe ſeveral Symptoms of the Venereal Malady our early Writers are very full in their Accounts of, and others, when the Diſeaſe was in a more confirmed State, to which they appropriated particular Names, perhaps more ſignificant and expreſſive than thoſe impoſed by modern Authors. Thus, for inſtance, the Bubo's in the Groins they called *Dorſers*, which I have given a Reaſon for before; and the Venereal Nodes on the Shin-bones they termed the *Boonhaw*, which gives us a perfect Idea, not only of the Part affected, but after what manner it was diſeaſed; for the old *Engliſh* Word *Hawe*, ſignified a Swelling of any Part. Thus for inſtance, a little Swelling upon the *Cornea*, was anciently called the *Hawe* in the Eye; and the Swelling that frequently happens on the Finger, on one ſide the Nail, was called the *white Hawe*, and afterwards *Whitflaw*. The Proceſs our laſt mentioned Author recommends, for the Cure of the *Boon* or *Bone-Hawe*, is by making uſe of a Plaiſter which had a Hole cut in the midſt, to circumſcribe it; and applying a Cauſtic of unſlacked Lime and black Soap incorporated together, which, with Plaiſter and Bandage, was to be ſecured on the Part 4 Hours, and longer, if that was not found ſufficient; after this, he proceeds to the ſeparating the Slough, *&c.* This Practice of his ſeems to have been found out by accident: For he tells us, when he was a young Practitioner, he having applied both the natural and artificial Arſenic to the Leg of a Man, that was his Patient, it ſo mortified the Fleſh, as ſurprized him; but by proper Digeſtives, the Eſchar coming off, and leaving the Bone bare, he ſcraped it with an Inſtrument for ſeveral Days, and dreſſed it with Incarnatives, deſigning to have ingendred Fleſh on it; but this proving unſucceſsful, he continued to ſcrape it, till he obſerved it move under the Inſtrument; after which, having ſeparated it, he found the Sore covered with new Fleſh, and that the Bone was 4 Inches in length, 2 in breadth, and very thick; upon the Removal of which, the Patient was ſoon cured. Thus 'tis probable, this Ob-

ſervation of this great Man led our Predeceſſors to practiſe the very ſame Method; and we do at this day, in our Hoſpitals, treat the Venereal Nodes on the Shins exactly as it is here deſcribed, where we obſerve the ſame Appearances, he ſo long before took notice of; and it is not in the leaſt to be doubted, but the Boon-Haw and our Venereal Nodes are the ſame Diſeaſe. By the Appearance of ſome of the laſt of the above-mentioned Symptoms, we infallibly judge the Patient has had the Infection upon him a conſiderable time, and that the Diſeaſe is making it's gradual Advances, to the corrupting and deſtroying the whole Frame of the Body. That this was the Concluſion of the Miſeries of thoſe Perſons, that gave themſelves up to the deceitful Delights and Entertainments of lewd Women, in thoſe early Times as well as now, I cannot better prove than from a *MS.* in *Lincoln* College, in *Oxon.* They are as follow; *Novi enim ego Magiſter* Thomas Gaſcoigne, *licet indignus, ſacrae Theologiae Doctor, qui haec ſcripſi & collegi, diverſos viros, qui mortui ſuerunt ex putrefactione membrorum ſuorum genitalium & corporis ſui; quae corruptio & putrefactio, ut ipſi dixerunt, cauſata fuit per exercitium copulae carnalis cum mulieribus. Magnus enim dux in Anglia, ſcil.* J. de Gaunt, *mortuus eſt ex tali putrefactione membrorum genitalium, & corporis ſui, cauſatâ per frequentationem mulierum. Magnus enim fornicator fuit, ut in toto regno Angliae divulgabatur, & ante mortem ſuam jacens ſic infirmus in lecto, eandem putrefactionem Regi Angliae Ricardo ſecundo oſtendit, cum idem Rex eundem Ducem in ſua infirmitate viſitavit; & dixit mihi qui iſta novit unus fidelis ſacrae Theologiae Baccalaureus. Willus etiam longae vir maturae aetatis & de civitat. Lond. mortuus eſt ex tali putrefactione membrorum ſuorum genitalium & corporis ſui, cauſatâ per copulam carnalem cum mulieribus, ut ipſemet pluries confeſſus eſt ante mortem ſuam, quum manu ſua propria eleemoſynas diſtribuit ut ego novi An. Dni.* 1430. Now what thoſe Inſtances mentioned from *Arden*, or thoſe from *Gaſcoigne*, who was then Chancellor of *Oxford*, could poſſibly be but Venereal Caſes, I would be obliged to any body to inform me. Certain it is, no Diſeaſe was ever known to be gotten by the carnal Converſation of Women, which firſt attacked the *Genitals*, cauſing a Corruption and Putrefaction of them, and afterwards of the whole Frame of the Body, but that which is Venereal. For nothing is more commonly known at this Day, than that after the Venereal Engagement with an impure Woman, the *Penis* is the Part where the Scene is firſt laid for the ſucceeding tragical Appearances, and there, and in the neighbouring Parts, do the Symptoms of the Diſeaſe, as it's Retainers, always firſt aſſemble, till the malignant Poiſon taints the Blood and other Juices; which being conveyed over the whole Frame of the human Fabric, if not checked, ſoon brings about it's total Corruption.

What I have further to add in relation to this, is, becauſe we do not find the Diſeaſe mentioned by *Gaſcoigne*, was diſtinguiſhed by any particular

particular Name, and that great Numbers muſt unavoidably die of the Venereal Malady at that Time, from the imperfect Knowledge of thoſe who had the Treatment of the firſt Degrees of it, it muſt neceſſarily follow, that when the whole Frame of the Body had received a Taint from the Venereal Poiſon, ſo as to occaſion it's breaking out in Scabs and Ulcers, almoſt all over it's Surface, it muſt generally be called by the Name of ſome particular Diſeaſe, whoſe Appearances had ſomewhat of an Affinity to it. Now if we examine the Nature of all the Diſeaſes that attack the human Body, we ſhall not find the Venereal Malady, when it arrives at this State, to bear a greater Similitude to any than the Leproſy, as it is deſcribed by the Ancients: Nay, ſo great was the Analogy betwixt theſe Diſeaſes ſuppoſed to be, that *Sebaſtianus Aquilanus* has endeavoured to prove from *Galen*, *Avicen*, *Pliny*, &c. that the *Pox* is only one Species of the *Leproſy*; and *Jacobus Cataneus*, a Writer almoſt as early as the Riſe of the Name of the *Pox*, tells us, it is not only poſſible there may be a Tranſition, from one of theſe Diſeaſes into the other; but that he ſaw 2 Perſons in whom the *Pox* was changed into the *Leproſy*; that is, from having great Pockes or Puſtules on the Surface of their Bodies, from whence the *Pox* is denominated, to have become ulcerous or ſcabby. This particular State of the Diſeaſe anciently put the Surgeons to a great deal of Trouble; for they finding that theſe Ulcers were of a very contumacious and rebellious Nature, were obliged to make uſe of great Numbers of Remedies, in order to conquer the evil Diſpoſition of them: But they obſerved that all of them were uſeleſs, unleſs *Mercury* were joined with them. Now the dreſſing each particular Ulcer being ſo very tedious, they ordered the Patients to daub the Ointments over the Parts which were ulcerated; which done, they were wrapt in Linnen-cloaths till the next Dreſſing: But after a few Days they were extremely ſurprized to find their Mouths began to be ſore, and that they ſpit very profuſely; but they tell us, to their Aſtoniſhment, that in a little time their Sores became healed, and the Patients cured. And by this Accident the Method of ſalivating by Unction was firſt diſcovered, which is in ſo much Uſe among us at this Day. From theſe and ſome other Inſtances I have given of the Induſtry and Application of our Predeceſſors, and with what Sagacity they applied every accidental Hint, to the relieving their diſtreſſed Fellow-creatures from the Misfortunes they laboured under; we ought to be led to the higheſt Eſteem and Veneration of them, (and ſo much the more moſt certainly) foraſmuch as they were principally our own Countrymen, who I can prove not only from ſeveral Perſons, coming from foreign Parts to be cured of their Diſeaſes here in *England*, but for other Reaſons that they excelled moſt of their Contemporaries in the divine Art of healing. Now altho' thoſe foreign Authorities, I before mentioned, might be looked upon as ſufficient to convince any

one, how our Anceſtors blended theſe two Diſeaſes together: Yet ſhall I purſue my deſigned Method, and prove from our own Writers, long before thoſe, that altho' the *Pox* was not only among us, but in diſtant Nations anciently confounded with the Leproſy; yet ſo exact were our Writers in their Obſervations of the infectious Nature of one Species of that Diſeaſe, and deſcribing the Symptoms, as was ſufficient to lead any Perſon to the diſtinguiſhing between them, ſo as to ſeparate one Diſeaſe from the other; I ſhall therefore firſt enquire into the Manner how the Leproſy was ſometimes ſaid to be gotten in thoſe early Times, and then examine the Symptoms of the Diſeaſe, that attacked the Patient. *John Gadiſden*, a very learned and famous *Engliſh* Phyſician, who flouriſhed about the Year 1340, in an excellent Work of his, he entitles, *Roſa Anglica*, ſpeaking, *de Infectione ex coitu Leproſi, vel Leproſae*, ſays as follows, *Primo notandum quod ille qui timet de excoriatione & arſura Virgae poſt coitum ſtatim lavet Virgam cum aqua mixta aceto, vel cum urina propria & nihil mali habebit*; and in another Place ſpeaking, *de ulcere Virgae*, he ſays, *Sed ſi quis vult membrum ab omni corruptione ſervare, cum à muliere recedit, quem forte habet ſuſpectam de immunditie, lavet illud cum aqua frigida mixta cum aceto, vel urina propria intra vel extra praeputium.* He likewiſe ſpeaking of the Leproſy, recommends a Decoction of *Plaintain* and *Roſes* in Wine, to be made uſe of by the Woman, immediately after the Venereal Encounter; upon which he tells us ſhe will be ſecure. From hence it is evident, ſome of their Leprous Women (as they called them) were capable of communicating an infectious Malady to thoſe that had carnal Converſation with them, which proves, the *Pudenda* of the Women muſt be diſeaſed, foraſmuch as we are abſolutely inſured Infections of that Nature only happen when a ſound Part comes to an immediate Contact with a diſeaſed one, for the Symptoms always firſt diſplay themſelves in thoſe Parts through which the Virulency is firſt conveyed. Now in a true Leproſy we never meet with the Mention of any Diſorder in thoſe Parts; which, if there be not, muſt abſolutely ſecure the Perſon from having that Diſeaſe communicated to him by Coition with Leprous Women; but it proves there was a Diſeaſe among them, which was not the Leproſy, altho' it went by that Name; and that this could be no other than Venereal becauſe it was infectious; for there is no other Diſeaſe that is capable of being communicated this way but the Venereal Diſeaſe, ſeeing the *Pudenda* are only in that Diſtemper ſo diſeaſed as to become capable of communicating their Contagion. I find the learned *Gilbertus Anglicus*, who flouriſhed about the Year 1360, reaſoning concerning the Manner how it is poſſible a Man ſhould be infected by a Leprous Woman; where if we allow him to call the malignant Matter, which is lodged in the *Vagina*, [*the Woman's Seed*] we ſhall find he accurately deſcribes the very firſt Venereal Infection, by part of the virulent Matters being received into the *Urethra*;

from whence by the Communication of the Veins and Arteries, it is conveyed into the whole Body, after which (ſays he) enſues it's total Corruption. Let us now examine the Symptoms of one ſort of their Leproſy, for it muſt be neceſſarily divided into different Species, when another Diſtemper was blended with it, in which we obſerve ſuch a Diverſity of Appearances; and this I ſhall the rather do in this Place, becauſe it will furniſh us with the next Succeſſion of Symptoms after thoſe already mentioned, as the Venereal *Ozænas*, the Ulcers of the Throat, the Hoarſeneſs, the Proof of it's being communicable from the Nurſe to the Child by hereditary Succeſſion. All which we find to be true in the Venereal Diſeaſe at this Day. Our Countryman *Bartholomew Glanvile*, who flouriſhed about the Year 1360, in his Book, *de Proprietatibus Rerum*, tranſlated by *John Treviſa*, Vicar of *Barkley* in 1398, tells us, *Some Leprous Perſons have redde Pymples and Whelkes in the Face, out of whome oftenne runne Blood and Matter: In ſuch the Noſes ſwellen and hen grete, the Vertue of ſmellynge falyth, and the Brethe ſtynkyth ryght fowle.* In another Place the ſame Author ſpeaks of *unclene ſpotyd glemy and quyttery, the Noſethrilles ben ſtopyl, the Waſen of the Voys is rough, and the Voyce is horſe, and the Heere falls.* Among the Cauſes of this ſort of Leproſy, he reckons lying in the Sheets after them, eaſing Nature after them; and others which the firſt Writers on the *Pox* looked upon to be capable of communicating that Contagion: Alſo, ſays he, *It comyth of fleſhly lyking by a Woman, after that a Leprous Man hathe laye by her; alſo it comyth of Fader and Moder; and ſo thys Contagyon paſſyth into the Chylde, as it ware by Lawe of Herytage. And alſo when a Chylde is fedde with corrupte Mylke of a Leprouſe Nouryce.* He adds, *by whatever Cauſe it comes, you are not to hope for Cure if it be confyrmyd; but it may be ſomewhat hidde and lett that it diſtroye ſo ſoone.* Thus we ſee how our Author under the Name of one Species of the Leproſy, gives a Summary of the Symptoms of the *Pox*, and the ſeveral Ways whereby it is at this time communicated. Now when theſe two Diſeaſes were anciently blended together, and paſſed under the Name of Leproſy only, it muſt be the real Cauſe why that Diſeaſe ſeemed to be ſo rife formerly; for two Diſtempers paſſing under one Name muſt neceſſarily make it more taken notice of, and much more frequent; not but that much the greater Number of thoſe who were formerly ſaid to be Leprous were really Venereal, ſeems to be very evident; for ſince that Diſeaſe has been ſeparated from the Leproſy, it has drawn off ſuch vaſt Numbers, that the Leproſy is become, as it were, a perfect Stranger to us. Thoſe that are acquainted with our *Engliſh* Hiſtory, well know the great Proviſion that was anciently made throughout all *England* for leprous Perſons, inſomuch that there was ſcarce a conſiderable Town among us but had a Lazar-houſe for ſuch diſeaſed. In a Regiſter which belonged to one of the Houſes, I find there were in *Henry* VIII's Time 6 of them near *London*, (*viz.*) at *Knightſbridge*, *Hammerſmith*, *Highgate*, *Kingsland*,

Kingsland, the *Lock*, and at *Mile-end*, but about 40 Years before I find but 4 mentioned; and in 1452, in the Will of *Ralph Holland*, Merchant-Taylor, regiſtred in the Prerogative-Office, mention is made but of 3, which, with his Legacies to them, are as follow: *Item lego Leproſis de Lokes, extra Barram Sti Georgii* 20*s*. *Item Lego Leproſis de Hackenay* (which is that at *Kingsland*) 20*s*. *Item lego Leproſis Sti Egidii extra Barram de Holborn* 40*s*. From which it is worth while to note, that the *Lock* beyond *St George*'s Church, and that at *Kingsland*, are at this time applied to no other Uſe than for the Entertainment and Cure of ſuch as have the Venereal Malady. Some of our learned Antiquaries have been much concerned to know the Cauſe why the Leproſy ſhould be ſo common in thoſe early Times, and ſo little known among us now: But I believe the Reaſon will be impoſſible to be aſſigned, unleſs we allow, according to the Proofs which I have already brought, that the Venereal Diſeaſe was ſo blended with it, as to make up the Number of the diſeaſed. It ſeems to have been the ſame thing with them in *France* as with us: For the Author of the Hiſtory of that *Kingdom*, which was lately publiſhed here in 2 Vols 8*vo*, tells us, that the Houſe of the Fathers of the Miſſion of St *Lazarus*, was formerly an *Hoſpital* for leprous People; but that Diſeaſe being ceaſed in this laſt Age, (ſince the Pox has been ſeparated from it) theſe Lazar-Houſes have been converted to other Uſes; and may not perhaps be foreign to my purpoſe to take notice, that the Writ *de Leproſo amovendo* contained in the Regiſter of Writs, was (according to *Coke* upon *Littleton*) to prevent leprous Perſons aſſociating themſelves with their Neighbours, who appear to be ſo by their Voice and their Sores, and the Putrefaction of their Fleſh, and by the Smell of them. Well, then, let us examine what Method muſt be taken to prevent this noiſome and filthy Diſtemper, the Leproſy: Why, truly, that which would infallibly prevent their getting the *Pox* after the uſual Method, and that was *Caſtration*. It is certain, that *Eunuchs* are rarely or never troubled with the Leproſy, according to M. *le Preſtre*, a Counſellor in the Parliament of *Paris*, who has theſe Words, * *Antipathia vero Elephantiaſis veneno reſiſtit: Hinc Eunuchi & quicunque ſunt mollis, frigidae & effiminatae naturae nunquam aut raro Lepra corripiuntur, & quidem quibus imminet Leprae periculum de conſilio medicorum ſibi virilia amputare permittitur*. And *Mezeray* ſays, he has read in the Life of *Philip the Auguſt*, that ſome Men had ſuch Apprehenſions of the Leproſy, (that ſhameful and naſty Diſtemper) that to preſerve themſelves from it, they made themſelves *Eunuchs*. Now it is highly probable, that theſe Perſons that ſubmitted to ſuch a painful Operation, having before obſerved, that thoſe that gave themſelves up to a free and unreſtrained Uſe of Women, fell at length under ſuch unhappy Circumſtances; and ſo found the only Meaſures

* Centur. 1. Cap. 6. de ſeparatione ex cauſa Luis Venereæ.

to

to preſerve themſelves from it, was to be diſabled for ſuch Engagements, which ſufficiently proves this Species of the Leproſy was infectious; and for the Reaſons before aſſigned, could be no other than Venereal; for how the true Leproſy ſhould be prevented by ſuch Means, will be, I believe, impoſſible for any Perſon to determine. There yet remains one very conſiderable Symptom of the Venereal Malady for me to take Notice of, becauſe it is looked upon to be the moſt remarkable in that Diſeaſe, which is, the falling of the Noſe; but ſince it has been already proved, that the Diſeaſe when it had arrived to ſuch a Pitch, as to diſcover itſelf by thoſe direful Symptoms as are the immediate Forerunners of this, was by the Ancients confounded with the Leproſy, and called by that Name, it muſt be among the Symptoms of that Diſeaſe we are the moſt likely to meet with it, if any ſuch thing as the falling of the Noſe was known among them. Now the moſt likely Method of coming to a certain Knowledge of the infallible Symptoms of the Leproſy of the Ancients in it's more confirmed States, is to conſult the Examinations thoſe unhappy Perſons were obliged to undergo, before they were debarred the Converſation of human Society, and committed to cloſe Confinement: But this being a thing ſome Ages ſince laid aſide, no Author that I know of having the particular Hiſtory of it, and ſomewhat of it being abſolutely neceſſary in this Deſign, I ſhall do it as briefly as I can from what Remains I have met with in Records and ſcattered Papers. Firſt then, After the Perſons appointed to examine the diſeaſed, had comforted them, by telling them this Diſtemper might prove a ſpiritual Advantage; and if they were found to be leprous, it was to be looked upon as their Purgatory in this World; and altho' they were denied the World, they were choſen of God: The Perſon was then to ſwear to anſwer truly to all ſuch Queſtions as ſhould be aſked; but the Examiners were very cautious in their Enquiries, leſt a Perſon that was not really leprous ſhould be committed, which they looked upon to be an almoſt unpardonable Crime: They conſidered the Signs as univocal, which properly belonged to that Diſeaſe, or equivocal, which might belong to another, and did not, upon the Appearance of 1 or 2 Signs, determine the Perſon to be a Lazar; and this I find to be the Caſe of the Wife of *John Nightingale*, Eſq; of *Burntwood* in *Eſſex*, who, in the Reign of *Edward* IV, *An.* 1468, being reported to be a *Lazere*, and that ſhe did converſe and communicate with Perſons in public and private Places, and not (according to Cuſtom) retire herſelf, but refuſed ſo to do, was accordingly examined by *William Hatteclif*, *Roger Marcall* and *Dominicus de Serego*, the King's Phyſicians; but they, upon ſtrict Enquiry, adjudged her not to be leprous, by reaſon the Appearances of the Diſeaſe were not ſufficient: Some of the Queſtions put to the leprous Perſons (as they called them) which will more fully confirm what I have before advanced, I ſhall now give as I tranſcribed them from an ancient Book of

Surgery : *Yf there were any of his Lygnage that he knew to be* Lazares, *and eſpecially their Faders and Moders, for by any other of their Kynred they ought not to be* Lazares, *then ought ye to enquire yf he hath had the Company of any lepreſs Woman, and yf any* Lazere *had medled with her afore him ; and lately, becauſe of the infect Matter and contagyous Filth, that ſhe had received of hym. Alſo yf his Noſtrills be wyde outward, narrow within and gnawn. Alſo yf his Lips and Gummes are fowle, ſtynking and coroded ; alſo yf his Voice be horſe, and as he ſpeaketh in the Noſe.* Now the Signs which are here mentioned, were looked upon to be univocal ; and theſe were they that made the Examiners principally determine the Perſons to be leprous : but what Determinations any one would immediately give from ſuch Symptoms now, no Perſon is ſurely ignorant of. But even theſe certain Appearances would not always ſatisfy ſome Perſons, if we may believe *Fælix Platerus* in his Medicinal and Chirurgical Obſervations, *Lib.* 3. who tells us, ſome did not look upon them to be ſo, till they had a horrible Aſpect, were hoarſe and Noſes fell. Likewiſe in the *Examen Leproſorum*, printed in the *de Chirurgia Scriptores optimi*, the Author ſpeaking of the Signs of the Leproſy relating to the Noſe, begins thus ; *Si nares exterius ſecundum exteriorem partem ingroſſentur, & interius conſtringantur, & coarctentur. Secundo ſi appareat cartilaginis in medio corroſio, & caſus ejus ſignificat Lepram incurabilem.* And the before-mentioned *John Gadiſden*, in his Chapter *de Lepra*, ſays as follows, *Signa confirmationis etiam incurabiliter ſunt corroſio cartilaginis quae eſt inter foramina & caſus ejuſdem.* Thus I have proved we had a Diſtemper among us ſome hundreds of Years before the Venereal Diſeaſe is ſaid to have been known in *Europe*, which was called the Burning ; that this Burning was infectious, and that it was the firſt Degree of the Venereal Diſeaſe ; that this being common at that time, from their Method of Treatment, the *Pox* muſt be unavoidable : That it had exactly the ſame Appearances it has now, altho' they were generally called by different Names, that the Ancients confounded it with the Leproſy ; that the vaſt Numbers of leprous Perſons among us, before the Venereal Diſeaſe was ſeparated from it ; and the ſmall Number we obſerve at this time, is a flagrant Proof of the former ; that in deſcribing the Symptoms of the Leproſy, they give us thoſe of the Venereal Malady ; and, by mentioning how it is communicated, they deſcribe the Ways by which the *Pox* is gotten at this Day ; that ſuch Remedies were by them recommended to prevent the firſt Attack of the Leproſy, as are at this time in uſe to prevent the firſt Symptoms of the *Pox* ; and that the falling of the Noſe, which has been looked upon to be the moſt remarkable Symptom of the Venereal Diſeaſe, was commonly obſerved in what they called the Leproſy in former Ages.

2. I was of Opinion that what I had ſaid in my two former Letters, had been ſo full and ſatisfactory, that I ſhould have had no Occaſion to have given any farther Trouble upon this Head. But foraſmuch as I find there have been 2 Objections made againſt what I have advanced, by 1 or 2 learned Gentlemen, I ſhall take upon me to anſwer them, and endeavour to prove they do not in the leaſt invalidate the Authorities I before produced. The firſt is, the *Venereal Diſeaſe* ſo well known among us now, and the *Leproſy* of former Ages, could not be the ſame Diſeaſe, becauſe the *Leproſy* is not to be conquered by Salivation, which the other generally very readily yields to. In anſwer to this, I am to obſerve, that the *Leproſy*, which we have among us at this time, affects only the Surface of the Body, the Skin generally appears ſcaly, with a certain deep red Colour, or ſmall Sores upon removing the Scales, and ſometimes a Scabbineſs, with a Redneſs of the Skin, which affects different Parts of the Body. I have known both the Cheeks only affected, both the Arms for the breadth of the Palm of the Hand, ſometimes the Breaſt, the Legs, and other Parts; but this may continue upon the Patient during his Life, as it frequently does, and never make any farther Progreſs, which ſhews it to be a cuticular Diſeaſe: In theſe Caſes upon ſalivating the Patients, the Scales generally fall off, the Redneſs diſappears, and the Cure ſhall ſeem to be compleated; but in a Month or two, the ſame Inconveniencies generally attend them as before. But one ought not to conclude, that becauſe our *Leproſy* will but rarely be cured by Salivation, and the *Pox* generally will, that many of thoſe Perſons the Ancients judged to be *leprous*, were not really *venereal*; for their *Leproſy*, as they called it, was a quite different Diſeaſe from ours. Had there been any Proof brought that Perſons had been ſalivated in their *Leproſy* and failed of Cure, it would have determined the Caſe; but on the contrary we are aſſured by Dr *Pitcairn*, in his Diſſertation concerning the Ingreſs of the *Lues Venerea*, that the *Leproſy*, before the *Neapolitan* Diſeaſe was talked of, was cured by *Mercury*, and now ſince it changed it's Name, it is no longer heard of. Thus we find that their *Leproſy* and our *Venereal Diſeaſe* would be cured by the ſame Method, but their *Leproſy* and ours being abſolutely different Diſeaſes, we by no means ought to expect the Succeſs, from the ſame Proceſs of Cure, ſhould be the ſame. I dare be poſitive that no body ever obſerved our *Leproſy* to be attended with falling of the Hair, hoarſeneſs of the Voice, ſpeaking as tho' he ſpake thro' the Noſe, Conſumption of the Fleſh, Ulcers all over the Body, corruption of the fleſhy Parts, and of the Bones themſelves, filthy Ulcers of the Throat, corroſion and falling of the Noſe, all which are reckoned as Symptoms of their *Leproſy*; on the contrary, ours is a mild and almoſt inoffenſive Diſeaſe, which a Perſon may be affected with during his Life, and never become worſe; whereas the other by diſplaying itſelf under the Symptoms be-

Continued by the ſame, N° 366. p. 108.

fore enumerated, brings the Patient to the moſt miſerable End; beſides this, their Diſeaſe was got by Coition, as their Authors aſſure us, but in our *Leproſy*, a diſeaſed Huſband may cohabit with his Wife, as long as he lives, and he ſhall never be able either by Coition, or the immediate Contact of the diſeaſed Parts with thoſe that are found to communicate any Evil. Had what our Predeceſſors called the *Leproſy* been the ſame Diſeaſe we call by that Name now, they had not been ſo ſollicitous of making ſuch large Proviſion for them, or ſhutting them up from human Society; for one of our *leprous* perſons might have been among them, and no body have known he laboured under any Infirmity at all. From hence it is evident the Diſeaſe ſo common among them, was entirely different from our *Leproſy*, the Appearances of which bear no manner of Analogy with the former. It is from the Symptoms of a Diſeaſe, and the manner of it's being received, that we generally know one Diſeaſe from another; but the Symptoms of moſt of their *leprous* Perſons, and the Manner whereby the Diſeaſe was gotten, will be found in no other Diſeaſe that attacks the human Body, but in the *Venereal Diſeaſe* only; for here they ſo exactly agree, that we muſt in a manner do Violence to our own Reaſon, if we deny them to be the ſame. I proceed now to anſwer the ſecond Objection, which indeed was long ago falſly aſſerted by Dr *Fuller* the Hiſtorian; which is, that the *Leproſy* was brought into *England* from the holy War, by ſome of our Countrymen, and the Diſeaſe was altogether unknown among us before. This, as I take it, does not ſo immediately concern me, ſince all I take upon me to prove is, that what *They* called the *Leproſy* is not the ſame Diſeaſe we call by that Name now, but another. However I ſhall in a few Words make it appear, that this Objection is likewiſe groundleſs, by obſerving that the firſt *Engliſhmen* that went over to the holy War, made their firſt Voyage in 1096, as our Hiſtorians generally agree, and that ſome of them returned in 1098, 2 Years after that Expedition; but moſt certain it is, we had the Leproſy among us before; for *Wharton*, *de Epiſcopis Lond.* and other Hiſtorians aſſure us, that *Hugo de Orivalle*, one of the Biſhops of *London*, died here of the Leproſy in the Year 1084; which proves, our Countrymen did not bring that Diſeaſe firſt from the holy War, becauſe we had it among us before. The Account *William* of *Malmeſbury* gives us of this Biſhop's Diſeaſe is as follows: *Is poſt paucos ordinationis annos in morbum incurabilem incidit. Si quidem regia valetudo totum corpus ejus purulentis ulceribus occupans ad pudendum remedium tranſmiſit. Nam credens aſſerentibus unicum fore ſubſidium ſi vaſa humorum receptacula, verenda ſcilicet, exſecantur, non abnuit. Itaque & opprobrium ſpadonis tulit Epiſcopus, & nullum invenit remedium, quoad vixit leproſus.* Now it's highly probable, had this been a new Diſeaſe the Biſhop died of, the Mention of it as ſuch, would not have eſcaped our Hiſtorian; but on the contrary it ſeems to have been anciently known among us, becauſe the Remedy

made uſe of for it was ſo, it having been recommended by *Aëtius*, and other Phyſical Writers ſeveral hundred Years before this time; and I think 'tis very plain that the cutting off the *Teſticles*, and with them the Veſſels formed for the receiving the Humours as expreſſed in the former Caſe, was by them looked upon to be of peculiar Service, becauſe 'tis probable, that obſerving the Diſeaſe to begin in thoſe and the neighbouring Parts, they thought the very *Minera morbi* would be by this Means deſtroyed, and the Diſeaſe either cured, or the ſpreading of it prevented.

An extraordinary Cramp. By Dr Steigertahl, *F. R. S.* No. 365. p. 79.

XX. *John Henry Oizmann* aged 31 Years, and born at *Barum*, fifteen Years of Age, when the following Misfortune befel him.

He felt a *Spaſmus*, or Cramp, in his left Hip, and the inferior Part of his Leg; as this Pain ſeized him pretty often, he conſulted Mr *Raek*, a Surgeon at *Ulzen*, who applied ſeveral Plaiſters to the Place where the Pain was, but without any Relief to the Patient. After all thoſe fruitleſs Efforts, the Surgeon, to ſee whether *Oizmann* had ſtill a feeling in his Leg (which to outward Appearances was become very brown) made about 37 Inciſions over the whole Leg of which the Patient was not at all ſenſible, except at ſuch times when the Inſtrument happened to grate upon the Bone, the *Perioſteum* being as yet ſound, and not infected by the Diſeaſe of the Fleſh. The Leg however did daily grow blacker, and the Pain continued both in the *Perioſteum*, and in all the Bodies of the ſuperior and inferior Part of the Leg. At laſt a black Circle was ſeen round about the Muſcles of the Hip, as an Indication of an approaching Putrefaction. This Circle appeared ſo viſibly, as if it had been cut off with a Knife from the other Part. It has ever ſince ſpread itſelf and come to ſuch a Head, that without any other Help and Cure, the Fleſh began gradually to rot away from the Bones, and at laſt quite fall away from the ſuperior Part of the Leg which has preſerved it's Soundneſs. After this, nothing was ſeen but the bare Tendons or Sinews hanging down like ſo many Strings or Cords. There remained alſo one Piece of the inferior Muſcles of the Hip faſtened to the ſuperior Part. At laſt the Tendons being grown dry, conſumed away, and after all, the Leg itſelf, I mean the *Os Femoris*, did wholly drop off in ſuch a manner, that there remained about 4 Inches betwixt the Bones and the Fleſh looſely hanging down from them. The Fleſh is at laſt grown up to the Bones, and without the Help of any Man has faſtened itſelf to them. And in this ſound Part the Patient feels a great Pain, whenever the Weather proves tempeſtuous. It is remarkable, that at the ſame time he perceives alſo a Swelling in *Tarſo pedis dextri*, the Matter whereof diſcharged itſelf through the Toes, and is of ſo corroſive a Nature, that it had conſumed all the Toes but the little one. The Surgeon has at laſt healed up this Wound; but after all there is yet but little feeling or warmth in the Foot.

XXI. A

An extraordinary Fiſtula, by the ſame, No. 365. p. 80.

XXI. A Woman who is now in her 41ſt Year, in her Youth had the Misfortune to be goared by a wild Boar under the ſhort Ribs of the left ſide. Of this Wound, ſhe has ſtill a Fiſtula to this Day; what Food ſhe eats diſcharges itſelf half concocted through this opening, and ſhe is obliged to clean this Wound often for that purpoſe, however ſhe has notwithſtanding this, her daily Evacuation *per Anum.* It is remarkable, that the Victuals thus diſcharged by the Wound are ſtill diſtinctly known what kind they have been of.

Uncommon Tumours. By Mr. Joſeph Atkinſon, *Sen. Surgeon.* No. 389. p. 340.

XXII. A Maiden about 20 Years of Age, was brought to me about *Chriſtmas* 1723, who had a Tumour on the inſide of her right Thigh, extending from the Groin to the Knee, which was ſo large, that I judged it contained at leaſt a Gallon; the *Cutis* was exceedingly diſtended, but of the natural Colour, only the capillary Veins appeared varicous, and very numerous; ſhe had alſo a large Tumour on the Buttock of the ſame Side, of the bigneſs of a Quartern Loaf; but when the Tumour on the Thigh was preſſed, the Tumour above very much encreaſed, which ſhewed a Communication, and proved afterwards ſo to be: She had alſo another Tumour on her right Side, ſtretching from the left Side of the *Vertebræ* of the Back to the *Hypochondrium*, about the bigneſs of a Penny Loaf; her Body was very much emaciated, and ſhe could hardly breathe, and the little Victuals ſhe eat, very difficultly paſſed out of the Stomach. She had had the *Menſes* but twice or thrice, about 12 Months before the beginning of thoſe Tumours, and it is to be marked, that the Tumour of her Thigh began firſt, and increaſed to near the Magnitude I firſt ſaw it, before the Tumour of the Buttock and Hip began; after that, the Tumour of her Back began, which, as it increaſed, brought on great Difficulty in Breathing. She had been with ſeveral other Perſons, who adviſed againſt opening the Tumour of her Thigh, moſt of them being of the Opinion it was from Blood, and that her Caſe was incurable: I confeſs, I was of a contrary Opinion; but being told what ſo many others had ſaid, I declined meddling with it at that Time, though her Parents and herſelf were willing to it: At this Time I diſmiſſed her, ſaying, that if ſhe lived, a little Time would diſcover more of her Caſe. About two Months after I was deſired to viſit her again, which I did, but the Tumours were ſo monſtrouſly increaſed, and her Body ſo waſted, that I wondered ſhe could live under ſuch Circumſtances; the Tumour of the Thigh was every Way yielding to the Preſſure of the Finger, nor was there the leaſt Hardneſs about the Extremities of it, ſo that it might be eaſily miſtaken for an *Aneuriſm*, had it not wanted the grand Characteriſtic, Pulſation, which ſome ſay, is not to be felt when thoſe are very large, the Middle of this then looked a little red, and ſhining, and ſeemed to point a little; I told them, I believe it would break with a ſmall Orifice, and ſhew what was contained, willing them to notify it to me if ſuch a Thing happened: Three Days after they called me in haſte, ſaying,

ing, the Swelling of her Thigh was broke; when I came, I found there had been diſcharged a ſmall Quantity of matteriſh Subſtance, much like what is contained in a *Meliceris*, but the Opening was ſo ſmall or cloſed, that I could not enter my Probe; however, though ſhe ſeemed to be ready to expire, yet, at the Deſire of her Parents, I opened this Tumour with my Launcet, making an Inciſion about an Inch and an half long, through which poured three Quart Baſons full of Matter, beſides ſeveral ſmaller, which together contained about five Quarts; it was very foetid and bloody towards the latter end of this Diſcharge; upon this, the Tumour wholly ſubſided, inſomuch that the Thigh inſtantly became as ſmall as the other; I put my Finger into the Wound, and found the *Faſcia lata* quite conſumed, the Muſcles lay all looſe, ſo that I fairly touched the Thigh-Bone between them as I would. Immediately upon the Diſcharge of this Humour, the Tumour on the Buttock was conſiderably abated, but there followed about two or three Spoonfuls of florid Blood; I dreſſed it up for this time with a proper Digeſtive, and a ſuitable Bandage; the Day following I viſited her again, and found ſhe had ſlept pretty well, and was much refreſhed, and not the leaſt Faintneſs had attended her during my Abſence, which ſhews the imaginary *Syncope*, that is feared to follow ſuch Evacuations, to be groundleſs; the Day following, taking off my Dreſſings, I found the Limb in it's Figure, but little bigger than the other: At the third Dreſſing there appeared a ſmall hard Swelling a little below the Orifice, which was made by ſome grumous Blood that lay there, which I turned out with my Finger, in Quantity about 4 Ounces: This was followed by a florid Blood, which much ſurprized me; I then judged this proceeded from ſome Hypogaſtric Veſſel that ſupplied this Tumour, and I deſpaired of Succeſs, unleſs I could meet with this Spring; ſo, in order to it, I laid open the Sinus to the Groin, and though I could not diſcover the Veſſel, yet I ſo ſucceſsfully applied my Aſtringent, that from that time it bled no more; however, there was for a Week, a great Flowing of a ſerous Matter, which wholly ſunk the Tumour of the Buttock and Hip, and by boulſtering and compreſſing with ſuitable Bandage, the ſo long ſeparated *Cutis* cloſed with the Muſcles, and all Things in about a Fortnight ſeemed to be in a fair Way of healing, yet, it was near three Months before this Cure was compleated.

But ſtill (that is, a Fortnight after the opening of the Thigh) the Tumour on her Back continued, and ſhe much ſtraitened for Breath; ſaying, if that was opened, ſhe ſhould be preſently relieved; this Tumour I then opened (which was, I ſaid, as big as a Penny white Loaf) and there iſſued out about two Quarts of Matter, or rather more: I was again greatly ſurprized that ſuch a Quantity, ſo much more than what poſſibly this viſible Tumour could contain, ſhould run out of this Orifice; I entered my Probe, and found it penetrate into the Cavity of the *Thorax*, between the ſecond and third ſpurious Rib,

reckon-

reckoning from beneath, on which ſhe reſpired with all Freedom, but there was a *Halitus* at this Wound: I continued to dreſs this, and believe, before this tended towards healing, not leſs (at times) than a Gallon, or rather 5 Quarts of Matter, was diſcharged; but, when I thought all was over, it filled again, the external Tumour became almoſt as big as before, and her Breathing as difficult as ever, ſo that I now thought all my Labour had been in vain; yet I opened it again with a larger Orifice, and from that Time dreſſed it ſucceſſfully, to the perfect Healing: The *Menſes* are returned, the Patient continuing well to this Day, and in a good State of Health.

A Copy of an Affidavit made in Scotland, *concerning a Boy's living a conſiderable time without Food. Communicated by* Patrick Blair, *M. D. F. R. S.* N° 364. *p.* 28.

XXIII. Court of the Barony of *Erroll*, holden at *Erroll*, upon the 26th Day of *December*, 1719 Year. By Mr *Charles Brown*, Baily to the Right Honourable *David* Earle of *Northeſk*, Lord *Roeſhill*, &c. *Gilbert Anthone*, Clerk; *Charles Gill*, Officer.

Court lawfully fenced and affirmed.

The whilk Day compeared before the ſaid Bailly ſitting in Judgment, *James Jackſon* fewar in *Carſe Crange*, and *Eliz. Bell* his Spouſe, who being purged of partial Council, ſolemnly ſworne and interrogat, depons, That *Gilbert Jackſon*, their ſixth Son, being about 15 Years of Age, fell ſick, and complained of Pains over all his Body, upon the 3d Day of *February*, 1716, when King *George* his Army was marching by their Dwelling-houſe from *Perth* to *Dundee*; and toward the end of the ſaid Month, was ſeized with a violent Fever, in which he continued for 3 Weeks, and then recovered.

2. That he fell in a Fever again the beginning of *April* thereafter, wherein he alſo continued for the ſpace of 3 Weeks; and during that Fever, he had a ſhaking in his Body, as if he had been paralytic.

3. Upon the 10th Day of *June* following, he fell in a great Fever again, when he became dumb, loſt his Stomach entirely, and the Uſe of his Limbs, and continued without eating or drinking any kind of thing, tho' all Means were uſed to make him do both; but recovered of his Fever upon the 17th Day of *May*, 1717, but continued ſtill dumb, without eating or drinking, or having the Uſe of his Limbs, till the 10th Day of *June* the ſaid Year, when he was again ſeized with an extraordinary Fever, and the next Day recovered his Speech, but continued in the Fever, without eating or drinking any thing at all, or having the Uſe of any of his Limbs, till the 11th Day of *November* following; when he recovered his Health pretty well, and the Strength of one of his Legs. And thus he continued without eating or drinking, only waſhed his Mouth ſometimes with Water; and always, when he ſaw the reſt of the Family going to take any kind of Food, the ſight of it being altogether uneaſy to him, he retired.

Upon the 10th Day of *June*, 1718 Year, he fell in a Fever again, which continued till the beginning of *September* thereafter, when he recovered of the ſaid Fever, tho' he never could be induced to take

any

any kind of Meat or Drink; and thus he continued in pretty good Health, and freſh coloured, till the 9th Day of *June*, 1719, when he was ſeized again with a ſevere Fever; and upon the 10th at Night, his Father preſſed him extremely to take a little Milk boiled with Oat-meal, which at length he agreed to; and he took a Spoonful of it, which ſtuck ſo long in his Throat, that his Parents thought he had been choaked; and ever ſince he has taken a little Food, but ſo very little, that a Halfpenny-loaf ſerves him eight Days. That all the time he faſted, he never had any Evacuation either by Stool or Urine; and it was 14 or 15 Days after he began to eat, that he got any Benefit that way; and that he is now in pretty good Health, but ſtill wants the Uſe of one of his Limbs. And this is the Truth, as we ſhall anſwer to God.

James Jackſon,
Elizabeth Bell,
Charles Browne, Baily.
Gilbert Anthone, Clerk.

XXIV. In 1704, *Peter Coffin*, Eſq; of *Exeter* in *New-England*, being then 74 Years of Age, had taken a great Sufeit, as it was thought, by drinking cold Water, in a very hot Day, after having heated himſelf in the Woods. This Surfeit ſettled principally in his right Side, but gave him a racking Pain all over his Body, and particularly deprived him of the Uſe of his right Arm: In this Condition he kept his Houſe and Bed for 9 Weeks, and his Recovery, conſidering his Age, was deſpaired of; when a Son of his, from whom I had the Relation, propoſed the ſweating of him in Turf: The Father readily agreed to it, having uſed many Medicines, without any Effect. Immediately Orders were given to cut a large Oven full of Turf; the Pieces might be to 18 Inches ſquare. The Turf itſelf was of *Engliſh* Graſs, and only the Swerd, or top of the Earth, with the Graſs. Before the Turf was put into the Oven, the Doctor rubbed the graſſy ſide of the Turf with ſome Spirit or Oil, and then doubled the Graſs-ſides together, and ſo ſet them in. When they were well baked, which was in about 2 Hours, he took them out, and made a Bed of them upon the Floor, (the Place for the Head raiſed); as ſoon as that was done, he ordered his Father to be taken out of his Bed without his Shirt, but wrapped up in a Sheet, and laid upon the hot Turf, and then proceeded to cover him over with the reſt of the Turf, more eſpecially on his Side, where the Seat of his Pain was, but they laid none on his Breaſt or Head; then they covered him with Blankets to keep the Heat in: While the Father was in this Bath, the Son gave him warm Cordials, to prevent fainting, which he was in great danger of: After he had lain thus about ¾ of an Hour, which was as long as he could bear it, he was put naked into the Bed very well warmed, where, in a few Minues he fell aſleep,

An extraordinary Cure by ſweating in hot Turf; with a Deſcription of the Indian *Hot-houſes; by the Hon.* Paul Dudley, *Eſq; F. R. S.* No. 384. p. 129.

aſleep, and ſweated to that degree, that it run thro' his Pillow and Bed, upon the Floor. After about 2 Hours Sleep they dried him, and put him on warm Cloaths, and he found himſelf much eaſed and refreſhed: This was in the Morning; and before Night he walked about the Houſe comfortably, his Pain being in a manner all gone: The next Day the Doctor repeated his Cordials, and the fourth Day he ſweated him a ſecond time, in the ſame manner as above; and next, *viz.* the fifth Day he went abroad about his Buſineſs, and lived 11 Years after in perfect Health, and free from Pain. The Doctor tells me, great Care muſt be taken that the Patient do not lie too long in the Turf, and even a $\frac{1}{4}$ of an Hour may be ſufficient for ſome Perſons; and whenever the Patient begins to fetch his Breath ſhort, or faint, he muſt be put to Bed immediately, and the Phyſician, or Operator, muſt by no means omit his Cordials. I ſhould have been glad to have made this Account yet more perfect, by acquainting you, what the Specific was the Doctor put upon the Turf, before he ſet them into the Oven; but I could not poſſibly prevail upon him to tell me.

Houſes, to ſweat in, were common among the *Aborigines*, when the *Engliſh* firſt came into *New-England*, tho' now but little uſed. A Gentleman of the Iſland of *Nantucket*, where the *Indians* ſometimes practiſe it, even at this Day, or very lately, gives me the following Relation. The Cave was uſually 4 Feet high, and 8 Feet Diameter; the Roof ſupported with Sticks or Boards, covered with Earth, and they dug it in the Side of a Hill, and as near as could be to ſome River, Pond, or Place of Water: The Entrance into this Cave was ſmall, and the Door (when any Perſon was ſweating) was covered with a Blanket or Skin; near the Cave they made a good large Fire, and heat a parcel of Stones, to the Quantity of 500 Weight, and roll them in red hot, piling them up in the middle of the Cave; when this is done, the *Indians* go in naked, and ſet round the heated Stones as many as pleaſe; as ſoon as they begin to grow faint, which may be in $\frac{1}{4}$ of an Hour,, they come out, and plunge themſelves all over in the Water for a Minute or two, and then in again, as long as they can well bear it, and ſo into the Water a ſecond time, and then dreſs themſelves. This has been uſed with Succeſs for Colds, Surfeits, Sciatica's, and Pains fixed in the Limbs; and even the *Engliſh* have found many times Relief by it. I do not underſtand, but that it may be practiſed at any time of the Year, without Hazard or Inconvenience. The *Indians* often uſed it before, and after long Journies, Hunting or Voyages, to ſtrengthen and refreſh themſelves.

XXV.

Statical Experiments on the Effects of warm bathing, by John Martyn, *F. R. S.* No. 407. p. 26.

		Weight. ℔.	ʒ.	After bathing 12 Minutes.		Urine.	ʒ
July 21.	A.	137	12	137	11 ½	3	
1728.	B.	134	15	134	13 ½		
h. 10 ½	C.	169	15	170 - - -			
at Night.	D.	119	6 ₂	119	7	4	

			Urine. ʒ.	Weight. after 1 h.		after bath. 20 Min.
22	A.	136	9 ½	135	15	136 - - -
h. 8 ½	B.	134	1 7	133	7	133 11
Morning.	C.	168	13	167	11	167 14
	D.	118	15	117 - - -		117 - - -

					Perſp.
h. 11	A.	137	5	After h. 1 ½	10 ½ ʒ
after eat.	B.	140	7	Exerciſe chiefly	13 ʒ
Cloaths	C.	170	4 ½	under Ground in	1 — ℔
changed.	D.	117	8	*Pool*'s *Hole*.	8 ½ ʒ

		℔.	ʒ.	ʒ	Perſpiration in 1 ½ h.
Aft. Din.	A.	136	14	3	where note, that all
Cloaths	B.	142	6 ½	7 ½	uſed moderate Exer-
changed.	C.	170	15	3	ciſe, walking about,
	D.	119	1	6 ½	except D, who ſate ſtill reading the whole time.

		Weight.		Aft. 1 h. bath.		Aft. 1. h. Perſp.	
Servant		℔.	ʒ.	℔.	ʒ.	℔.	ʒ.
who at-		173	4	173	6	172	15
tended the							
Bath.							

From theſe Experiments may be concluded, 1. That warm bathing increaſes the Weight of the Body for the preſent; tho' it cauſes a plentiful Perſpiration afterwards: Which I do not remember that any one has hitherto obſerved. 2. That the Perſpiration after this Exerciſe is nothing near ſo large as Dr *Keill* * has delivered; it amounting, by his Account, to 1 ½ Pound in 1 Hour's time. By our Obſervation it is but 5 Ounces in 1 Hour, and from 8 ½ Ounces to one Pound, in 1 ½ Hour, tho' aſſiſted by Motion; which might

* Med. Stat. p. 16.

have cauſed us to perſpire (by Dr *Keil*'s Computation *) from 3 to 6 Ounces.

An Account of a Book, entitled, Adverſariorum Anatomico Medico Chirurgicorum Decas tertia. *Auctore* Fred. Ruyſch, *M. D. Anat. & Bot. Prof.* Amſtel. *R. S. S.* No. 379. p. 428.

XXVI. In § I. The learned Author, who has ſo long improved the World by his curious Searches into the niceſt Secrets of the Animal-Machine, and illuſtrated them by his admirable Preparations, gives an Account of preternatural Things found in Tumours, of that Sort which we call *Atheroma*, ordinarily a *Ghyſt* filled with a thick Matter like Pult; ſuch are Bones, Fleſh, Hair, Teeth, and other Things very ſurprizing and unaccountable.

In § III, he tells us a remarkable Story of a Girl, who had frequent Eruptions of Blood from the Skin of her Head, Ears, Mouth, Navel, and the Nipples of her Breaſt: For 14 Weeks ſhe eat no Meat, nor had any Excretion by Siege or Urine; and many other odd Symptoms.

In § VII, he ſays, very often, upon diſſection of Bodies of old Women, he has found the meſenteric Glands, that miniſter to the Conveyance of the Chyle, perfectly waſted away; ſo that he judges it not improbable, that, in ſuch Caſes, the meſaraic Veſſels abſorb the Chyle from the Guts, and carry it into the Blood, at leaſt in part, according to the Notion of the Antients, who knew not the lacteal Veſſels: This he thinks not a little confirmed by the like waſting of the glandular Part of the Breaſts in old Women, which tho' formerly very large, ſhall have nothing but the Nipples left.

* Calore, motu & exercitio unciæ 2 vel 3 interdum 4 perſpiratione unius horæ expelluntur. *Med. Stat. p.* 15.

CHAP. VII.

The Bones, Joints and Muſcles.

Obſervations upon the Bones and the Perioſteum; by Mr Lewenhoek, *F. R. S.* No. 366. p. 91.

I. I HAVE lately found that the ſuperficial Part of the Bones conſiſts of an inconceivable Number of ſmall Veſſels, and ſome few of a larger Size; which laſt, when they came to the Surface of the Bone, appeared to me to be cloathed either with a Membrane or a bony Subſtance, that was perfectly tranſparent. I once happened to diſcover in a ſmall Portion of a Shin-bone, 4 or 5 Veſſels of ſuch a Size,

Fig. 120.

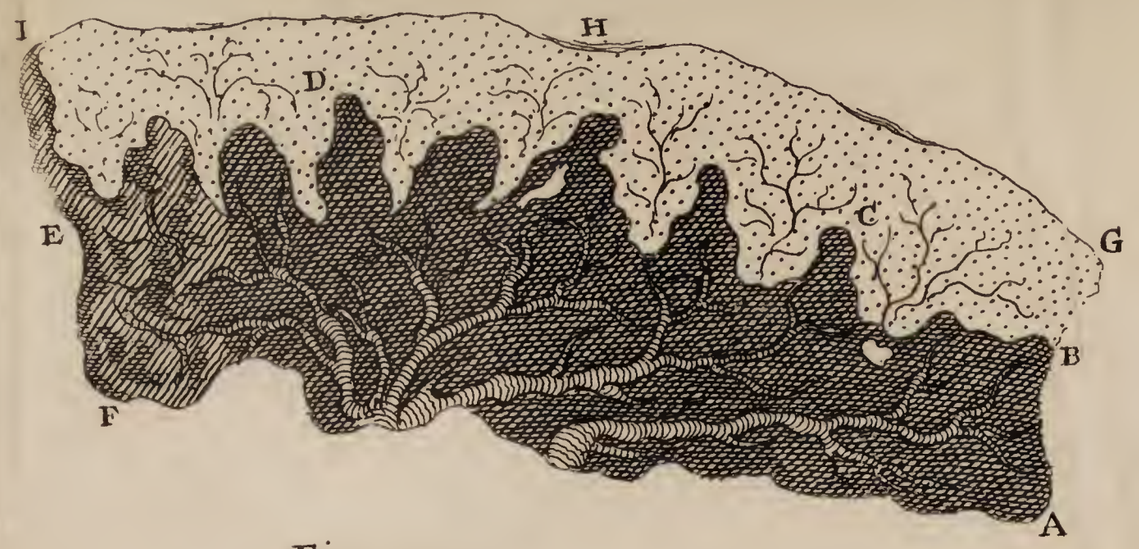


Fig. 121

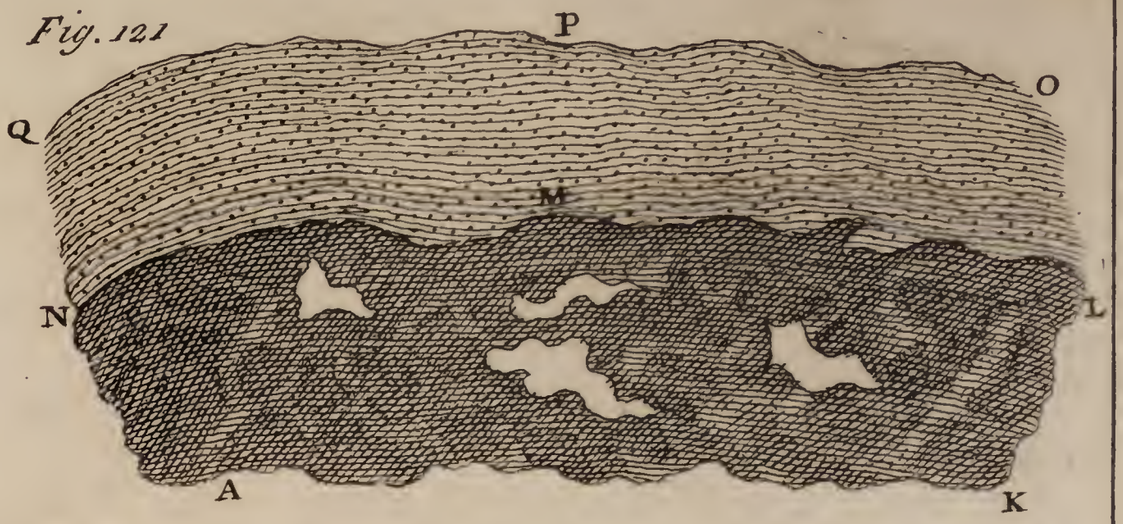


Fig. 122

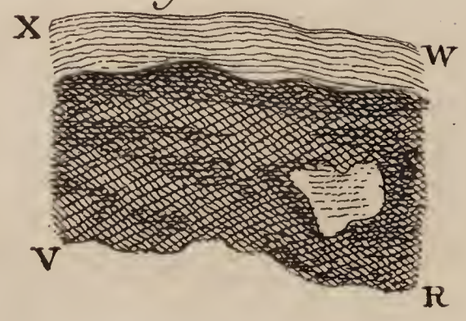


Fig. 123

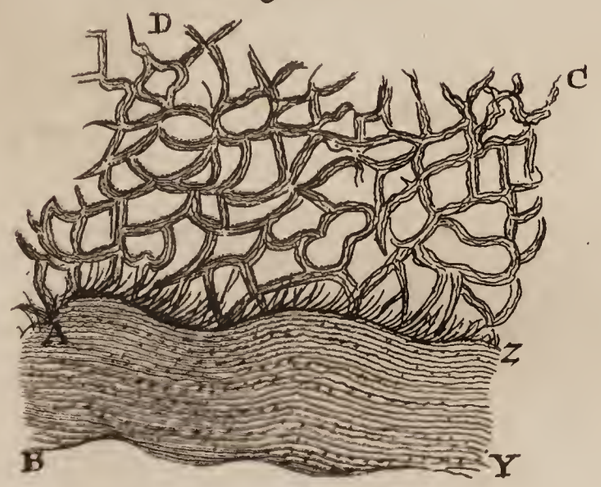


Fig. 124.

Fig. 125

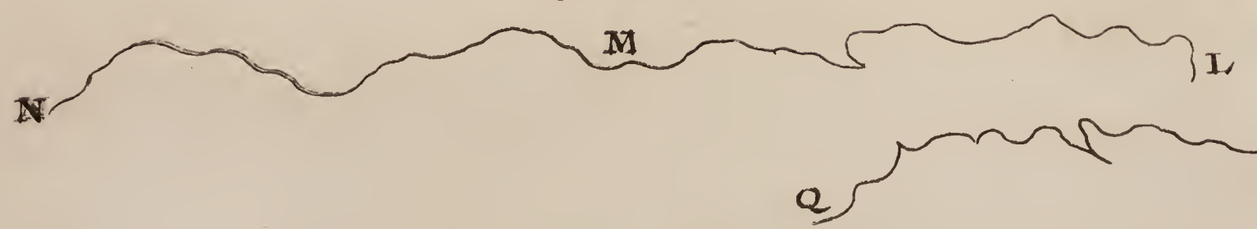
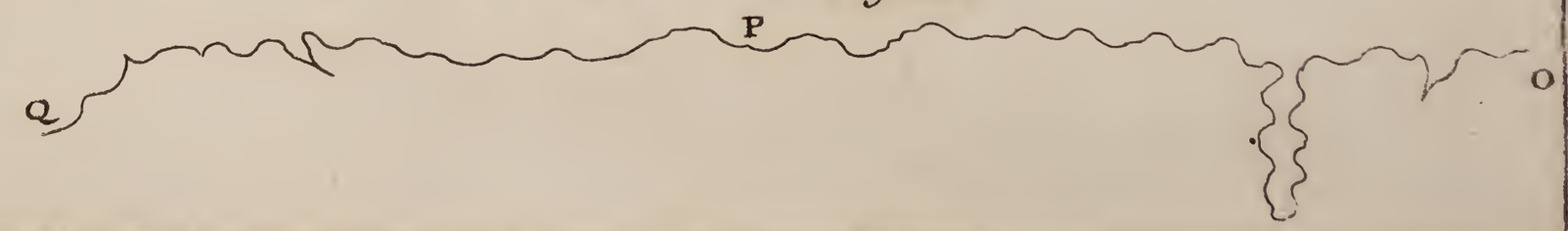


Fig. 126



Size, that a ſingle Filament of Silk might have been drawn through their Aperture. One of theſe appeared to me to conſiſt of 2 Openings, each of which ſeemed to be provided with a Valve, which was diſpoſed in ſuch a manner, as to let out what was contained in the Veſſel, but to ſuffer nothing to go in. In all my Oſervations upon the Surface of the Bones, I never, but this one time, diſcovered ſo many of theſe Veſſels in ſo ſmall a Compaſs.

As for that Matter, which iſſues from the Bones, and is carried into the *Perioſteum*, I have diſcovered the Source of it to be the ſpongy or cellular Subſtance on the inſide of the Bone, which is the Repoſitory for this Marrow. This ſpongy Subſtance conſiſts of long Particles cloſely united and linked together, which Particles are compoſed of an infinite Number of ſmall Veſſels, ſome running lengthwiſe, and others taking their Courſe towards the Sides of the bony Particles. Theſe bony Particles, notwithſtanding their great Number of Apertures, are yet exceeding hard, and lie ſome of them parallel, and others perpendicular, to the Length of the Bone. Thoſe Particles, that lie perpendicular to the length of the Bone, have Veſſels proceeding from their Ends; and from their Sides, where they do not lie cloſe together, proceed other Veſſels, that compoſe the *Cortex*, or ſuperficial Part of the Bone. And thoſe long Particles that lie parallel to the Length of the Bone, ſend out Veſſels from their Sides, that iſſue out thro' the Side of the Bone. It is impoſſible for thoſe, who have not ſeen this, to conceive the prodigious Number of ſmall Veſſels, of which the cortical Part of the Bone conſiſts; which in ſome Places lies no thicker upon the ſpongy part of the Bone than a thick Hair of a Man's Head, tho' in other Places it has 3 or 4 times that thickneſs.

To the Cortex of the Bone, the *Perioſteum* is united, not only on the outſide, but even by entring in many places into the very Subſtance of the Bone, and is joined to it by the Veſſels, which iſſue from the Bone, in ſuch a manner, that ſometimes one cannot determine which is the Bone, and which belongs to the Membrane inveſting it, they both appear in the Microſcope to conſiſt alike of exceeding ſmall Veſſels.

To make this be the better underſtood, I have given in *Fig.* 120, a Repreſentation of a ſmall part of the Bone, with the *Perioſteum* adhering to it, in which A B C D E F repreſents the bony Part, whether taken from an Ox, or Sheep, I do not now remember. The *Perioſteum* is marked B G H I E, the Thickneſs of which is deſigned by B G, or I E, tho' in other Places of the Bone, and even at no greater Diſtance than 2 or 3 Hairs Breadth, it is twice or thrice as thick. We ſee here, that all the ſmall Veſſels in the *Perioſteum* are repreſented by ſo many Dots or Points; but in other Places, where I had ſeveral times ſeen the Membrane of twice this Thickneſs, the upper Part of it has appeared to be of a different make from the under Part, for as much as in the upper Part I could *Fig.* 120.

diſcover not only thoſe Veſſels that had been cut tranſverſly, and which conſequently were repreſented by ſo many Points, but likewiſe a great number of other Veſſels running lengthwiſe along the Membrane, as is repreſented in *Fig.* 121, by L O P Q N M. *Fig.* 121.

I am fully perſuaded, that the Part repreſented by B G H I E, *Fig.* 120, is not entirely membranous, but that ſome part of it is really bony. If we cut thro' the *Perioſteum* ſo deep as to divide the part of the Bone marked A B C D E F, in the ſame Figure, we find the ſame Appearance of Pores in the bony Subſtance, which are no other than the tranſverſe Sections of ſmall Veſſels; and beſides theſe, there are other Veſſels running longways in the Bone. And we find juſt the ſame in thoſe tranſparent Parts, that lie between the bony Particles, which are repreſented thicker between B C D E, than they appeared to me. It is my Opinion, that the Uſe of theſe bony Particles is, to convey an oleaginous Liquor into the *Perioſteum*; and that from the *Perioſteum* it is carried by the Intervention of the other Membranes into all Parts of the Body, when in a healthful Condition. In another Place, I ſaw a great Number of Veſſels ariſing from a greater Depth within the Bone, which drew cloſer together, ſo as to compoſe ſmall *Faſciculi* before they entred the *Perioſteum*, in which they ſeparated from one another, and diſperſed themſelves again. It is difficult to determine, whether theſe Veſſels bring any Liquor into the Bone, or carry it out, but I rather think they ſerve to carry it out. Having placed another piece of Bone before the Microſcope, with the *Perioſteum* adhering to it, I could diſcover a great Number of Veſſels that I had cut thro' lengthways, as they ran along the *Perioſteum*, and others that were cut thro' tranſverſly, and appeared as ſo many Points, as is repreſented in *Fig.* 121. by K L O P Q N A, where the bony Part is marked K L M N A, in which, tho' no Pores, or Veſſels, are here repreſented, yet it is full of Openings. That Part which is deſigned by L O P Q N M, we muſt not take to be entirely membranous, for I am of Opinion, that that part of it, which lies next the Bone, and which is repreſented by L M N, is of a bony Subſtance.

I had another ſmall piece of Bone lying before a Microſcope, of which I cauſed a Part to be repreſented by R S W X T U, *Fig.* 122, in which R S T U is the Bone, and S W X T the *Perioſteum*, which in this Place was no thicker than a thick Hair of a Man's Beard, but in another Part of the ſame Bone, at a ſmall diſtance, it was full four times that thickneſs. *Fig.* 122.

I placed another piece of Bone before a Microſcope in ſuch a manner, as that the Bone did not appear, but only the *Perioſteum* and the Muſcular Fibres, which were cut thro' tranſverſly, and appeared to be ſurrounded by the *Fibrillæ* of the Perioſteum, as in *Fig.* 123, where Y Z A B is the Perioſteum, and Z C D A are the fleſhy Fibres cut thro' tranſverſly. This piece of Bone was taken from one of the Ribs of a fat Ox, and I was ſurprized to find, that in this Place, as I cut *Fig.* 123.

long-

longways through the Rib, I could not discover any Particles of the Marrow, whereas in other Parts the Rib abounded with them.

I had kept four pieces of Ribs of a fat Ox full two Months, which were now grown very dry. I cut off a very thin slice, and placed it before a Microscope. It is presented by A B K C, *Fig.* 124, having been cut off transversly and as thin as possible from the Rib, with part of the Periosteum, as from K to C, still adhering to the Bone, and another part of it torn off from the Bone, as designed by B K D, except that in some places the Bone, and the Membrane are still united by Vessels torn out of their places, that run from one to the other. In this Figure D E F C represents the Periosteum, and the Part designed by E G H I F, is something lying upon it, which I could not tell what to make of, tho' it appeared to me to be membranous. *Fig.* 124.

I had likewise some very thin slices shaven off from the Rib, both of an Ox, and of a Calf, from which I tore off the Periosteum entirely, or at least as much of it as possibly as I could; after which I caused the edge of the Bone it had stuck to, to be represented by the crooked Line, L M N, *Fig.* 125. *Fig.* 125.

In *Fig.* 126. O P Q represents the edge of another small slice of Bone, from which the Periosteum has been torn off, by which appearance it should seem, that the Union of the Periosteum with the Bone is so firm and strong, that in separating it, some of the superficial Particles of the Bone are torn off with it. I have likewise discovered some Vessels running along within the Marrow-bone of the Shank of an Ox that seemed to be Blood-Vessels. *Fig.* 126.

Since now it appears from our Observations, which have been made with great Diligence and Care upon Bones of all Kinds, that for the most part they consist of exceeding small Vessels which arise from the inner, hollow, or spongy part of the Bone, and passing thro' the superficial or cortical Substance, enter the *Periosteum*, and are from thence continued even unto the utmost parts of the Body; we may from hence reasonably conclude, that, in a healthful Body, as there is a constant Supply of an oily Substance carried into the Bones, so this is again constantly carried out from the Bones, by means of these Vessels, into all parts of the Body, even to the extremities of the Fingers. To give an evident Proof of this, let any man lay the ends of his Fingers upon a clean and bright Pewter-Plate, and he shall find the Pewter appear soiled in the Place where he has touched it; for in reality this soil is nothing else, but some oleaginous Particles discharged from the ends of his Fingers. There is indeed something of a watery Substance mixed with the oily Particles, but this evapourates in a little time, and leaves the oily Particles lying upon the Plate.

II. *Nov.* 5. 1713, *John Fletcher*, on board the *Neptune* of *Liverpool*, had the Misfortune to break the *Radius* and *Ulna* (of his left Arm) and their Ends burst thro' the Skin. He was immediately dressed by the Surgeon of the Ship with the common Astringents and Bandages; about 5 or 6 Days afterwards I was sent for to see him. When I came

Of the coming off of the Scapula *and Head of the* Os Humeri, *upon a Mortification.*

by Mr Peter Derante, *Surgeon in* Waterford. No. 370. *p.* 15.

came there, I found his Surgeon along with him, who told me, That the Man would do very well, becauſe he was in no Pain at all; however, I deſired him to take off the Dreſſings, and let me look on it. Which being done, I found it was black and inſenſible from his Fingers to his Shoulder, and therefore adviſed the Extirpation of it immediately, but his Surgeon oppoſed it; however, I ſcarified it in ſeveral Places, and very deep, and then applied a warm Dreſſing. Next Day the Ship put to Sea, and the poor Creature was ſent to *Waterford*, and committed to my Care. As ſoon as I could get my *Apparatus* ready, I cut off his Arm as high as poſſible; then I cauterized the Stump, which was perfectly mortified as high as the *Acromion*. Next day I perceived the Mortification ſpreading toward the lower Angle of the *Scapula*, then I rubbed the Edges of the Mortification with armed Probes dipped in a Solution of *Argent. viv.* in *Aq. Fort.* which compleatly anſwered my Intention; for from that time the Mortification ſpread no further; next Dreſſing I ſcarified and cauterized all the mortified Part, and dreſſed it *ſ. a.* I continued this Method for 17 or 18 Days, and then the Sloughs began to ſeparate and caſt off daily; ſome time afterwards the *Scapula* began to part from the *Os Humeri* and *Clavicula*, and at length came out whole; I was then put to it what to do about the ſtump of the *Os Humeri*, which ſtill adhered to the *Pectoralis* and *Latiſſimus Dorſi*; but in a little time it alſo ſeparated and came away, without any Hemorrhage ſucceeding, which I expected. I was afterwards obliged to cut off part of the *Clavicula*, before I could cicatrize the Wound, which was ſoon afterwards accompliſhed.

A preternatural Tumour on the Loins of an Infant, attended with cloven Spine; by W. Rutty, *M. D. F. R. S.* No. 366. *p.* 98.

III. Mr *Ruyſch*, in an Obſervation on the *Spina bifida*, takes notice that other Writers have deſcribed it to be cloven into two equal Parts longitudinally, as Butchers ſplit the Back-bone of an Ox or Sheep; whereas out of ten Subjects, which he had an opportunity to examine, not one proved to be in that manner, the body of the *Vertebræ* being entire, and the *acute proceſſes* only divided. Pretty near this Deſcription, is the Spine to be treated of. The Back bone is of a female Infant 6 Days old; whoſe Mother, when 7 Weeks gone with Child, upon a Fright occaſioned by her Huſband's falling from a Horſe, and very much bruiſing his Loins, gave the *Embryo* this Injury: but notwithſtanding ſhe went out her time, and the Child was full grown. There appeared upon the region of the Loins, in the ſame place where the Father received his hurt, a Tumour about the bigneſs of a ſmall Turnep, with a broad Baſis, around which the Skin was diſcoloured, as by an *Ecchymoſis*, but it grew immediately from thence pellucid, like a Veſicle raiſed by *Cantharides*, and continued ſo throughout, except juſt at it's Apex, where was a ſubſtance like a *Fungus*. This Bladder was filled with a Liquor, which in ſcent and colour reſembled the true Urine: inſomuch that, upon ſtrictly examining

examining the Linnen ſtained by what iſſued from hence, with that from the *Pudenda*, we could perceive no ſenſible difference, and concluded there was a Communication between the left Kidney and the Orifice, into which the Surgeon's Probe paſſed obliquely upwards, about an Inch. Whether the ſame Similitude may hold betwixt the Urine and this Liquor, in all Caſes of the like Nature, I have not had opportunities to obſerve: but as Mr *Ruyſch* has taken no notice of it, in ſuch a number of Subjects, that have been before him, I am apt to think, that it does not; being eaſily perſuaded, that if it did, it would not ſo often have eſcaped his inquiſitive Reſearches. The Kidneys, contrary to Expectation, were perfect, and did not any way communicate with the outward Orifice. But upon clearing away the fungous Subſtance, which took up all the *Sulcus* or hollow of the *Spine*, we found where the Perforation tended, a long Probe eaſily paſſing up the Channel, which contains the *Medulla Spinalis*. Throughout this *Fungus* were diſperſed a great many endings of ſmall Nerves, from whence diſtilled this, as it were, urinous Liquor, which occaſioned the Tumour: The reſt of the *Medulla* was more compact, and filled the Cavity of the *Spine*, tho' in ſome Subjects it has been waſted to ſuch a Degree, that by blowing into the Orifice you may inflate the *Dura Mater*. The coat of the Tumour conſiſted at it's Baſis of the *Cuticula*, *Cutis*, and *Membrana adipoſa*: the two firſt of which forthwith terminating, the *Cuticula* only was continued, immediately under which appeared the *Muſcles* and *Fungus* abovementioned. In this it differs from thoſe of Mr *Ruyſch*, which received their Coats from the Membranes that cover the *Medulla*: as likewiſe from thoſe taken notice of by *Tulpius*, which borrowed theirs from the *Peritonæum*, as he ſays, tho' by his own Deſcription, it is more likely they proceeded from the ſame Membranes. Theſe Tumours conſtantly attend the *Spina bifida*; inſomuch that when any of them preſent themſelves on the Loins or Back, of a new born Infant, we have good grounds to pronounce *This* to be the Cauſe; but we may be poſitive in it, if the Child cannot move it's lower Limbs, the want of which Motion is an infallible Indication, that the *Medulla Spinalis* reaches no farther than the Swelling, whereby the Nerves are not diſtributed to thoſe Parts. They appear differently in different Subjects. In ſome the whole Tumour is *opake*, which proceeds from ſmall Filaments of Nerves propagated in great Numbers throughout it's coat, and not from the Thickneſs of the Skin, as *Ruyſch* will have it. In others it is *pellucid*, and then the *Medulla* terminates at once at the Aperture of the Spine, and does not ſhoot out into any Ramifications. This before us is a Compoſit of both Species, the greater part of which was pellucid, the leſs, *viz.* the Apex, *opake*. The Back-bone itſelf, is not cleft, but has it's *Vertebræ*, with their *other Proceſſes* entire, and is only defective in it's *Spines* or *acute ones*. But that portion of the *Vertebræ*, which ſhould make an acute

Angle, from whence their *Spinal Proceſſes* naturally ariſe, in order to form the *Specus*, or Paſſage for the Marrow, inſtead of that, gapes and lies almoſt in a ſtrait Line on each Side; whereby the *Medulla* is defrauded of it's uſual Guard from external Injuries. This Defect begins at the third *Vertebra* of the Loins, and is continued to the End of the *Os Sacrum:* Which laſt is very extraordinary, it ſcarcely ever happening to this Bone; the Reaſon of which I take to be the more than ordinary Compactneſs of the *Vertebræ*, whereby it is leſs liable to be injured by any Impreſſion. For we obſerve, that in Adults they grow ſo cloſe together, as to unite and form one large and ſolid Bone.

As the Caſe before us is a *Vitium conformationis* owing to the Mother's Imagination, ſo the ſame ſometimes is occaſioned by Matter lodging upon the Spine, and eroding the *Vertebræ* by it's Acrimony: But then you find a *carious Bone*; whereas in theſe *preternatural* Caſes, there remain no ſuch Footſteps. This was obſerved in the Body of the late Lord *Peterborough*, as related by Mr *Cowper*; upon the Opening of whoſe Body he found a large Tumour, from whence flowed a browniſh coloured Matter; and under it, the upper and fore Part of the ninth, and the lower Part of the eighth *Vertebræ* of the *Thorax* were conſumed and gone, the *Medulla Spinalis* being covered with it's Membranes only. This gave Riſe to thoſe Symptoms in that morbid Caſe, ſo nearly reſembling the above recited in this preternatural one. It is manifeſt from what has been ſaid, that theſe Caſes are incurable, and muſt in a little time kill the Patient. But it is almoſt immediate Death to open the Tumour; which every Surgeon will naturally do, that has not ſeen or read concerning it; the Fluid ſeeming to require a Diſcharge.

A Caſe in Surgery, which is commonly miſtaken for a Fracture of the Patella; *by Mr* Deverel, *Surgeon at* Briſtol. No 365. p. 44.

IV. *Richard Burt*, living near *Briſtol* was thrown from his Horſe, and in the Fall received ſuch a Hurt in one of his Knees as made him incapable of remounting: He felt ſomewhat crack in that Knee (as he expreſſed it) before it touched the Ground. Upon examining the Part, I found (as I then thought) the Ends of the broken Bone drawn above 4 Fingers diſtance from each other: But upon a ſtricter Examination of the Parts, I found the *Patella* (which was drawn upwards by the Extenſors of the Leg) retained it's natural Figure, and that the Hardneſs which was felt below was the End of the torn Ligament that ties it to the *Tibia*. The Ends of the Ligament were brought as near as poſſible, and kept ſo about 3 Weeks without any very remarkable Accident intervening. He then began to walk, which was a little too ſoon, cauſing thereby ſome Pains, and looſening the Cicatrix, which made it the longer before it was perfectly firm; however he walks now without any perceptible Lameneſs. I have met with two others in the ſame Caſe; the one a Perſon of Diſtinction, who has not met with the good Fortune of walking ſo well as ſhe uſed, tho' not for want of all the Care and Circumſpection

ſpection imaginable ; for it is hardly to be expected that one in ten, to whom this Accident happens, ſhould ever go right, it being next to an Impoſſibility that the Ends of the torn Ligament ſhould be ſo placed, and retained, as not exactly to lie one over the other.

Pareé in the 22d Chapter of his 15th Book affirms, that he never ſaw one of thoſe who have had this Bone broken, but that halted during the reſt of their Lives : I am very apt to believe what this excellent Author affirms about the halting, and am ſorry I muſt diſſent from his Notions of the Caſe, and the Cauſe of the Lameneſs. *Hildanus* in his *Obſervationes Chirurgicæ*, *Cent.* 5. *Obſerv.* 88. *p. m.* 485, has given us a Hiſtory of a tranſverſe Fracture of this Bone, which, after all the Symptoms were removed, was cured. *Sed claudicatio ac ſumma imbecillitas totius cruris ſecuta eſt, ita ut non niſi maxima cum difficultate ambulare poſſit.* He afterwards mentioning the Cauſe of the Lameneſs, makes a Quæry, if what *Pareé* (to whom this Obſervation is dedicated) ſays in his *Exc. lib. de Oſſibus*, *lib.* 4. *cap.* 2. can be the Cauſe of the Lameneſs ; his Words are, *Etſi vero opinionem hancce rationi conſentaneam eſſe in dubium revocare minime conabor, unus tamen reſtat ſcrupulus, viz. an, fractâ patellâ, extuberantia calli talis eſſe poſſit, ut cavitatem hancce (quae inter femur & os tibiae magna eſt) adeo ad impleat ut motum actionemque genu impedire poſſit ? Videmus enim ut plurimum in reliquis oſſium fracturis, (niſi contritio oſſis & perioſtei fuerit maxima) naturam tam decenter & eleganter connectere oſſa, ut raro relinquatur veſtigium fracturae. Perioſteum enim, quam diu integrum eſt, materiam calli retinet, quo minus in extuberantiam excreſcere poſſit, niſi, &c. Deinde in hoc noſtro Ægro callum non fuiſſe cauſam claudicationis ex ſequentibus apparebit : quapropter diſtinctione hic opus eſt.* After this he goes on to ſhew us how many ways this Bone may be fractured, but doth not obſerve that he ever ſaw it any other way broken, (unleſs in a Gun-ſhot-Wound) than tranverſly ; if he had, I am perſuaded, that this curious Obſervator would never omitted it in his Obſervations. *Ruyſch* in his *Centuria Obſervationum Anatomico-Chirurgicarum* 4to, *Obſ.* 3. writes as follows: *Patellam propter duritiem ſuam haud frangi poſſe nonnulli perverſe aſſerunt. Nos vero eandem non ſolum à caſu graviori in genu frangi experti ſumus, verum etiam ſine caſu ; cujus rei Hiſtoriam recenſere animus eſt. Ante tres praeter propter annos, viſitavi cum Magiſtro Petro Adriani filio, virum ſatis robuſtum, qui à ponte deſcendens in terram fere ceciderat ; uno pede lubrico, reſiſtens tamen quantum potuit, in terram non fuerat prolapſus ; ſed ab illa reſiſtentia vehementiſſima tranſverſim fracta ejus patella, & adeo quidem evidenter, ut inter utrumque locari potuerit manus, una enim ſupra altera infra genu ſentiebatur.* This Obſervation is ſo like in all it's Circumſtances to that which I related above, eſpecially in that the Fracture was made without a Fall, that I am very apt to believe it is the ſame ; and imagine he might be deceived by miſtaking the hard End of the Ligament for the broken Bone. And when theſe Sort of Accidents, which are now called Fractures

of the *Patella*, come to be nicely examined, they will perhaps be found to be generally of the ſame Nature.

Of the difference in the Height of a human Body, between Morning and Night, by the Rev. Mr Waſle. No. 383. p. 87.

V. 1. Having obſerved ſeveral Soldiers diſcharged for being a little under the Standard, and having experienced the difference of a Man's Height in the Morning and at Night, I mentioned it to an Officer, and thereby kept ſome Perſons from being turned out of the Service. Since that Time I have meaſured a great many ſendentary People, and Day-Labourers, of all Ages and Shapes, and find the Difference to be near an Inch. I tried myſelf, when ſitting, and found it in the like manner; particularly *Auguſt* 21, 1723. Weather warm, no Wind, at 11 in the Morning I ſat down, and fixed an iron Pin ſo as to touch it, and that but barely. After that, I fatigued myſelf for ½ an Hour with a Garden-Roller; and the Conſequence was, that at 12 H. 30 Min. I could not reach the Nail ſitting, by about $\frac{5}{100}$ of an Inch, or the Breadth of one of the Rods of *Hunt*'s Sliding-Rule. At 2 the ſame Day I wanted near $\frac{6}{100}$ of an Inch. On the 21ſt at 6 H. 30 Min. in the Morning, I touched the Nail fully; and after the above-mentioned Exerciſe for only ¼ of an Hour, at 7 H. 14 Min. I fell ſhort almoſt as much as before. On the 27th, having ſat up late with ſome Friends, I was faint, and felt myſelf heavy upon the Ground, and without any Spring, and at 9 that Morning I did not reach the Nail, tho' I had uſed no Exerciſe. I rid out, but could not reach it that Day. On the 28th I rid about 4 Miles; and whereas at 6 that Morning I reached the Nail, I had loſt $\frac{15}{100}$ of an Inch by 8. *Septemb.* 19, I came from *Oxford* a little tired, and next Morning at 8 I wanted ½ an Inch. If I ſtudy cloſely, tho' I never ſtir from my Writing-deſk, yet in 5 or 6 Honrs I loſe near an Inch. All the difference I find between Labourers and ſedentary People is, that the former are longer in loſing their Morning Height, and ſink rather leſs in the Whole than the latter. I cannot perceive, that when the Height is loſt, it can be regained by any Reſt that Day, or by the Uſe of the cold Bath. I have not informed myſelf ſo well about Horſes. My Mare comes 7 this Graſs, is ſtrong, ſhort backed, and well legged. I meaſured her before and after riding 20 Miles, *April* 30, and could not perceive the leaſt difference in her Height. The Alteration in the human Stature, I imagine, proceeds from the Yieldings of the Cartilages between the *Vertebræ*, to the Weight of the Body in an erect Poſture.

This curious Obſervation has been confirmed by ſeveral Members of the Royal Society, and others who have purpoſely tried the Experiment.

Remarks on the foregoing Obſervation; by Mr W. Becket, *F.R.S.* No. 383. p. 89.

2. I have obſerved farther, that in young Perſons the Alteration has been more conſiderable than in thoſe that have been aged. The Trials equally ſucceeding in a ſitting as in a ſtanding Poſture, will naturally lead us to believe, that it muſt neceſſarily be from the Trunk of the Body, or ſome of it's Parts, that this remarkable Alteration

teration is brought about. Now every body knows, that the Standard of a Perſon's Stature has been always looked upon to be determined by the whole *Compages* of the Bones, adjuſted by the Divine Architect according to the ſtricteſt Rules of Geometry. But there is ſomething ſo wonderful in the Structure and Diſpoſition of the Spine, that nothing but ſuch a peculiar Contrivance could ſo curiouſly have fitted it for the reſpective Uſes and Purpoſes it was ordained for. The Thickneſs and Shortneſs of the Bones, with the intervening Cartilages, aſſiſted by the bony Proceſſes, diſpoſe it to a Motion peculiar to itſelf: Whereas, had the Bones been of any conſiderable Length, upon bending the Body, the Articulations muſt have made a large Angle upon their inmoſt Edges, and the ſpinal Marrow have been continually liable to be injured; or had the Cartilages been entirely wanting, it would have been as uſeleſs as if it were but one Bone, whereby we being rendred incapable of bending the Trunk of the Body, it muſt have always remained in an erect Poſture. But by the preſent Diſpoſition of it's Parts, it is not only abſolutely ſecured againſt any ſuch Inconveniencies, but, altho' ſo ſmall a Pillar is capable of ſupporting, without hazard, ſuch prodigious Weights, as we are not wanting in our Accounts of. Another Particular, which beſpeaks the utmoſt Wiſdom and Deſign in the Contrivance of this Part, is, the remarkable Difference there is in the Thickneſs of the Cartilages, placed betwixt the Bones of the Spine; the *Vertebræ* of the Breaſt requiring but little Motion, the Cartilages are there but thin, in compariſon of thoſe of the Loins, which being very thick, the loweſt more eſpecially, the Motion is there vaſtly greater; and the Cartilages being abundantly thicker before than behind, this is the Reaſon that we bend our Bodies ſo much more forward than backward. And by this admirable Method of diſpoſing of the thicker Parts of the Cartilages forward, it is, that in all violent Exerciſes, the Parts contained in the Belly and Breaſt are in a great meaſure ſecured from any Damages to which they might have been liable, becauſe by the Pliableneſs and Elaſticity of theſe Cartilages, they break the violent Shocks the *Viſcera* muſt otherwiſe have neceſſarily ſuſtained upon ſuch Occaſions. From what I have here remarked, in relation to theſe peculiar Properties of the Cartilages placed between the Bones of the Spine, we may reaſonably ſuppoſe them to be certain compreſſible, dilatable, elaſtic Bodies, which like other Bodies, endued with the ſame Qualities, will naturally yield to any incumbent Weight, ſufficient to force the Particles of Matter of which they conſiſt, into a more ſtrict and cloſe Union, and that when this compreſſive Power is removed, they will of themſelves recover that State they enjoyed before they were obliged to give way to that Preſſure. Now I am here particularly to obſerve, that the loweſt of all the Cartilages of the Loins is the thickeſt, and ſo conſequently that it contains a greater Quantity of Matter than any of the reſt; by which

Means it becomes more diſpoſed to have it's Thickneſs diminiſhed, and that all of them gradually become thinner, even to the top of the Spine. Now all ſuperiour Bodies, if they come to an immediate Contact, preſſing upon their inferiour, it muſt neceſſarily follow, that the whole Weight of the Body, except the lower Limbs, muſt preſs upon and be ſuſtained by the loweſt *Vertebræ* and their Cartilages; but theſe Cartilages, as has been obſerved, being much thicker in this Part than the other, and the incumbent Weight bearing harder upon them, they muſt be unavoidably compreſſed more than the other; and ſo, conſequently, when this Weight is removed, their Expanſion, from their natural Elaſticity, will be greater alſo. This being the natural State and Diſpoſition of theſe Parts, during the whole ſpace of Time we are uſually employed about our neceſſary Avocations till we diſpoſe ourſelves to Reſt, the Cartilages of the Spine will, by their compreſſible and yielding Properties, become more cloſe and compact from the perpendicular Preſſure they ſuſtain, and ſo conſequently the Spine, the only Support of the Trunk of the Body, will become ſhorter. But when this ſuperiour Weight ſhall be entirely removed, by placing the Body in a horizontal Poſture, as it always is when we are in Bed, the compreſſed Cartilages will, by their natural elaſtic Power, begin gradually to enlarge themſelves, till they recover the ſame expanded State they enjoyed before they were forced to give way and yield to the incumbent Preſſure; and ſo conſequently it will produce a conſiderable Alteration in a Perſon's Stature, agreeable to the determined Times mentioned in the preceding Letter. For if we only conſider that the before-mentioned compreſſive Power will leſſen the Thickneſs of all the Cartilages, in proportion to the quantity of Matter they contain; and that there are uſually reckoned about 24 in Number, it will be no difficult Matter for us to apprehend, that their natural Expanſion being recovered by our cuſtomary Repoſe, the Aggregate of the whole of the Expanſions may amount to about an Inch. Now if the Alteration be ſo conſiderable as this, occaſioned only by the bare incumbent Weight of the ſuperiour Parts of the Body, without any additional Force applied to compreſs the Cartilages yet cloſer, how much more may we reaſonably imagine it would be, were the Experiment tried on ſuch Perſons, whoſe uſual Employment it is to carry heavy Burdens. I have only this one Particular farther to obſerve upon this Head, which is, that this Alteration is not to be expected to be the ſame in aged Perſons as in thoſe that are younger, becauſe the Cartilages, as we advance in Years, gradually grow harder, and till many of them arrive to the ſolidity of a Bone; that is, by degrees they loſe their Spring or expanſive Power, and at length continue in a compreſſed State of Reſt. And this is without doubt one principal Cauſe, why old People not only ſeem to have loſt ſomewhat of their Height, but are actually ſhorter.

VI. 1. Haud ita pridem, circa magnum illud & neceſſarium organum, quod diaphragma vocitamus, vehementi ſum motu correptus; adeo quidem ut adſtantes non parum turbarentur. Cum motus remitteret, & morbi illius nomen exquirerem, Medicus, qui aderat, cordis eſſe palpitationem reſpondit. Ergo vero Medicum falli cenſebam, licet enim, durante motu, pulſum arteriae ſaepius manu explorarem, nullam pulſus accelerationem percepi. Vehemens ille motus, per intervalla recrudeſcens, tres circiter dies duravit; quo tempore ſtomachus mihi & inteſtina in officio motuque ceſſabant, mortemque pro foribus eſſe certiſſime credebam. Ego vero obſtructionem in diaphragmate haerere judicabam, non minorem nummo imperiali.

A Palpitation of the Diaphragm; by Mr Ant. a Lewenhoek, *F. R. S.* No 377. *p.* 341.

2. Ut autem de hac Diaphragmatis affectione omnem mihi dubitationem eximerem, Diaphragma ovis anniculae ad me deferendum curavi; partem illius Diaphragmatis in minuta fruſtula confectam, ope microſcopii, qua potui diligentia conſideravi; comperique Diaphragma ex parte compoſitum eſſe ex tenuiſſimis fibrillis; quae ſine microſcopio conſpectae latum circiter capillum inter ſe diſtant. Cum deinde diverſa Diaphragmatis fruſta diverſis microſcopiis applicuiſſem, & viſu diligenter examinaſſem; pro certo ſtatui fibrillas illas ex partibus exoriri carnoſis, quae Diaphragmati circa coſtas intexuntur. Eaſdem fibrillas Diaphragmati vice tendinum inſervire judicabam. Tendines iſti, ſic mihi dicti, non ſunt per totum Diaphragma aeque ſibi vicini: Quin alii aliis, quamvis ſibi vicinis, ſunt aliquanto craſſiores. Cum autem & fibrillas modo dictas, & membranam inter fibrillas exporrectam, rite conſideraſſem; animadverti Diaphragma, quantum ad maximam ſui partem, ex fibrillis iſtis, & membrana fibrillis interjecta, compoſitum eſſe: Si tamen vaſorum ſanguineorum & copioſi adipis, quae Diaphragmati magna copia inſident, rationem modo non habeamus. Membrana vero, inter tendines (ita mihi dictos) interjecta, tot rugulis exiguiſve plicis ſcatebat, ut pene obſtupeſcerem: iſtas autem rugas ſive plicas ad hunc uſum naturaliter deſtinatas eſſe credebam, ut Diaphragma per aëris inſpirationem extenſum rurſus contraherent; eaque ratione opem ſuam conferrent ad aërem, qui Pulmones per inſpirationem impleverat, inde expellendum. Ut Diaphragmatis contexturam oculis ſpectandum exponerem; exiguam Diaphragmatis ovilli modo dicti portionem delineari, deſignari curavi. Ubi B G, C F; & D E, tres ſunt tendines, ea magnitudine expreſſi, quam microſcopium oculis exhibebat: qui tendines, ut jam ante monui, magnitudine non parum inter ſe differunt. Inter illos vero tendines membranam interjectam videmus; ex quibus tendinibus, & interjecta membrana, Diaphragma maximam partem compoſitum eſſe modo dicebam. Ut autem de vera iconis hujus magnitudine judicare poſſitis, delineatorem, ut veram fruſtuli delineati magnitudinem digito indicaret, rogavi; qui mox ſpatium inter Y Z in icone 130 commonſtravit. Adhaec membranam modo dictam permultis iiſque exiguiſſimis foraminibus pertuſam eſſe obſervavi: quae

Of the Structure of the Diaphragm; by the ſame. No. 379. *p.* 400.

Fig. 127.

Fig. 130.

ab

ab abdomine patebant in pectus, & a pectore viciſſim in abdomen. Cum autem fieri non poſſe hactenus judicaverim, ut humor quiſpiam ex pectore delabatur in abdomen, vel ex abdomine ſubvehatur in pectus; nunc ſatius mihi videtur, judicium ſuper ea re meum ſuſpendere. Quin ſic mecum differo; forte etiam pulmonibus noſtris vaſcula inſunt incomprehenſibilis exilitatis. Quippe ſi cogitemus, quantum humoris ex pulmonibus noſtris per exſpirationem educatur in aërem, prae exigua humoris copia quam inſpirando ex aëre inferimus in pulmones; facile in ſententiam illam propendebimus. Sed & hoc non ſemel obſervavi, quod fibrillas illas, quas tendines appello, vaſa quaedam perrepant itinere tranſverſo. In alio ejuſdem Diaphragmatis fruſtulo, quod microſcopio applicatum ſervabam, clare intueri licebat ſtructuram exortumque membranularum; quas inter fibrillas, ſive tendines ſic mihi dictos, interjacere dixi. Membranulas illas permagno plicarum numero, inſtructas videmus: quae omnia exhibentur ad L K. Fibrillae vero, deſignantur per L M N O P Q. *Fig.* 128. Verum fibrillae iſtae ſunt hic majores, quam uſpiam mihi occurrerint. Praeterea membranam illam, ex qua Diaphragma maximam partem conſtare dixi, quamvis tam tenuem, a ſe divelli, & exiguam avulſae partis portionem ope microſcopii exprimendam curavi. Quod eo conſilio feci, ut laceros tendines atque membranulas, quantum ars imitari naturam poterat, oculis ſubjicerem. Ergo hic per R S T V particula indicatur tendinis extenſi: ubi & exiliſſimae exhibentur fibrillae, ex quibus praedicta tendinis portio contexta eſt. *Fig.* 129. Per V T & W X portio deſignatur tendinis quieſcentis. Iſtud vero neque explicari, neque ſatis comprehendi poteſt, quam incredibilis fibrillarum, vaſculorum, & particularum numerus hic inter ſe conglomeretur; & ad tenuiſſimae membranae, Diaphragmatis inquam, formationem concurrat. Sic autem ſtatuo, quoties validius inſpiramus, omnes illas plicas ſive ſinuoſas corrugationes in Diaphragmate evaneſcere atque complanari: quoties autem exſpiramus, Diaphragma rurſus in plicas rugaſve contrahi, quod & ſuperius notavi. Dum igitur tantam adipis copiam in Diaphragmate gigni, & congregari videmus; praetereaque cogitamus ſubſtantiam Diaphragmatis per adipem illum ſic utrimque poſſe craſſeſcere, ut in tumorem extuberet; facile intelligemus Diaphragmatis expanſionem atque contractionem ea ratione poſſe impedire atque pigreſcere, atque hinc ſpirandi difficultatem conſequi: ob quam rationem homines obeſos prae aliis anhelos eſſe judicamus. Modico autem adipe Diaphragma perfundi oblinique neceſſarium ſtatuimus: cum enim id ſingulis horis nongenties expandi & nongenties contrahi neceſſe ſit; motus illos per adipem magnopere adjuvari cenſemus. Ceterum frequentiori indagatione explorare conatus ſum, qua ratione carneae Diaphragmatis partes, quas coſtis vicinas eſſe dixi, tranſiiſſent in membranam; ſive qua ratione membrana Diaphragmatis ex illis eſſet exorta. Verum licet indagationem illam crebro frequentarem, ipſe mihi ſatisfacere non potui. Jam & illa dubitatio me

ſubierat,

ſubierat, an non tendines, vaſculis ſint inſtructi: Et licet microſcopio meo vix tantum tribuere auderem; tamen tertio poſt die indagationem iteravi, & tendines tranſverſe diſſecui: quando & illuc indagationem meam dirigebam, ut etiam in membrana Diaphragmatis, quam rugoſam eſſe dixi, ſanguinea vaſa ſecundum longitudinem tendinum protendi, imo octonos denoſque invicem adjacere viderem. Inde ad membranam, quae tendines quaſi circumveſtit, oculos converti; in eaque tam ingentem obſervavi numerum exiliſſimorum vaſculorum, ut admiratione defixus haererem. Complura iſtorum vaſculorum velut areolis incluſa jacebant; quae tendinum tranſverſe perſectorum vaſcula eſſe cenſebam. Ut autem eorum omnium, quae modo narravi, teſtem haberem ocularem; microſcopium iſtud, cui dictas Diaphragmatis particulas applicaveram, Chirurgo meo tradidi; qui dicta mea cum iis quae videbat adamuſſim convenire reſpondit.

Hac tamen obſervatione non contentus, comparavi Diaphragma bovillum; ex quo circa partes illius carneas, quas coſtis adjacere dixi, fruſtum circiter palmarium excidi: comperique Diaphragma bovillum circiter quadruplo craſſius eſſe ovillo; & hanc craſſitudinem maxima ex parte illius adipi acceptam eſſe referendam. Ex inde ex illa Diaphragmatis portione lamellam quam potui tenuiſſimam abſcidi; quoties enim paulo craſſiorem exſcindebam, perſecabam adipem, qui verſus medium Diaphragmatis portenditur; puta ubi Diaphragma ſatis eſt craſſum, neque adipis expers. Diaphragma vero utrimque, id eſt, ſuperius atque inferius, quatuor diſtinctis conſtat membranis, earumque tendinibus; qui tendines membranis veluti incluſi deliteſcunt. Iſtorum autem tendinum ingens multitudo non poterat mihi non admirationem parere: neque ſatis credibile videbatur in corpore, cujus ſtructura functioneſque tam parum ſunt cognitae, in Diaphragmate inquam, tales tamque multiplices partes includi. Ut Diaphragmatis bovilli ſtructuram oculis exponerem, partem illius ad A B C D exprimendam curavi, ubi primo quatuor exhibentur partes diſtinctorum tendinum, qui magno numero invicem adjacent, & ſupra in Diaphragmate ovillo etiam ſunt exhibiti. Verum per integrum bovis Diaphragma iſtiuſmodi diffunduntur exiguiſſimi tendines, quos ego quidem ſic appello. Et hos quidem tendines, una cum membranis, neceſſe eſt in rite conſtituto corpore ſine ulla intermiſſione alternatim extendi atque contrahi. *Fig.* 131.

Tenuiſſimas illas fibrillas, uti & membranarum rugulas plicaſve, per crebram indagationem etiam ex voto meo deprehendi in Diaphragmate ovillo; nec ipſe tantum ſaepius cum voluptate conſideravi, ſed & aliis conſiderandas exhibui. Caeterum tendines illos, & tenuiſſimas particulas tranſverſe perſecui; inquirere volens num forte ſint perviae, & cavitatibus praeditae. Quando incredibilis exilitatis vaſcula tanto numero in oculos meos incurrerunt; ut, qui ipſe non viderit, vix mihi ſit habiturus fidem. Tum & ingentem percepi numerum exiguiſſimorum vaſculorum, quae tranſverſo Diaphragma

itinere permeabant ; & quantum ego quidem sentiebam, ad hoc officium à natura destinantur, ut adipem per omnes Diaphragmatis partes circumferant, & ipsi Diaphragmati continuum alimentum subministrent. Superius modo dixi adipem in Diaphragmate inclusum latere ; & utrimque super adipem 4 exporrigi membranas, inter se omnino distinctas. Addo membranas istas tam arcte sibi conjunctas esse, ut simplex esse membrana videatur. Jam vero alteri microscopio, quod paulo minus quam microscopia modo dicta magnitudinem objectorum augebat, frustum Diaphragmatis mediocris crassitudinis admoveram. Quod eo spectabat, ut demonstrarem, qua ratione membranae partes Diaphragmatis adiposas, sive ipsum Diaphragmatis adipem, utrimque circumdent ; adeo ut adeps in membranis illis includi videatur. Per *Fig.* 132. E F G H, item per I K L M, duae istae quadruplices designantur membranae ; in G H vero, & I K, adeps saepe jam dictus includitur. Cum deinde tenuissimam Diaphragmatis portionem, quae prae manibus erat, in orbes conscindere conarer, Diaphragma in duas partes sive lamellas secessit ; unde suspicatus sum Diaphragma sic à natura comparatum esse, ut adeps eo facilius per Diaphragmatis substantiam distribuatur. In icone 132, ubi membranae transverse sectae exhibentur, quaedam exiguae apparent corrugationes, quas in iis plerumque percepi. Postea comperi membranulas, in quibus adeps coeundo producitur, exilissimis vasculis annexas esse ; quae tamen vascula per contiguarum partium exsiccationem in Diaphragmate jam dicto erant disrupta. Hanc ego membranularum & vasculorum connexionem ex eo capite necessariam existimo ; ne Diaphragma, quoties extenditur, omnino complanetur, sed in cavitatem pene globosam sese expandat.

Forte complures Diaphragma sentient esse membranam apprimè crassam ; cum tamen sit membrana perexilis. Ut igitur hunc illis errorem eximam ; frustulum Diaphragmatis bovilli, sicut se nudis oculis offert, delineandum curavi : Istud tamen verum est, Diaphragma pro *Fig.* 133. tenuitate sua esse oppido robustum, quod multitudini exilissimorum tendinum, de quibus saepius egi tribuendum esse statuo. Per N O P Q, frustulum designatur Diaphragmatis bovilli : ubi per fibrillam N O unum latus, sive dimidia crassitudo, Diaphragmatis bovilli indicatur ; per P Q altera crassitudinis illius medietas exprimitur. Reliquum Diaphragmatis, nempe quidquid inter O P & N Q intercluſum est, adipe sive partibus adiposis est obsitum : nisi quod inter N Q nonnihil carnis interjaceat, pertinens ad carnem costis adjacentem. Medicos igitur errare cogito, qui palpitationem, quàm in pectoris regione quandoque percipimus, cordis palpitationem appellant. Certe ego tales palpitationes ex mala Diaphragmatis affectione oriri censeo ; sive affectionem illam producat alimenti defectus, sive vasorum quorundam efficiat obstipatio, quae Diaphragma magno numero pervagantur. Talis enim obstipatio in ante dictis tendinibus facile convulsivos motus excitare potest ; & hanc morbi mei ipsissimam fuisse causam existimo.

Fig. 127

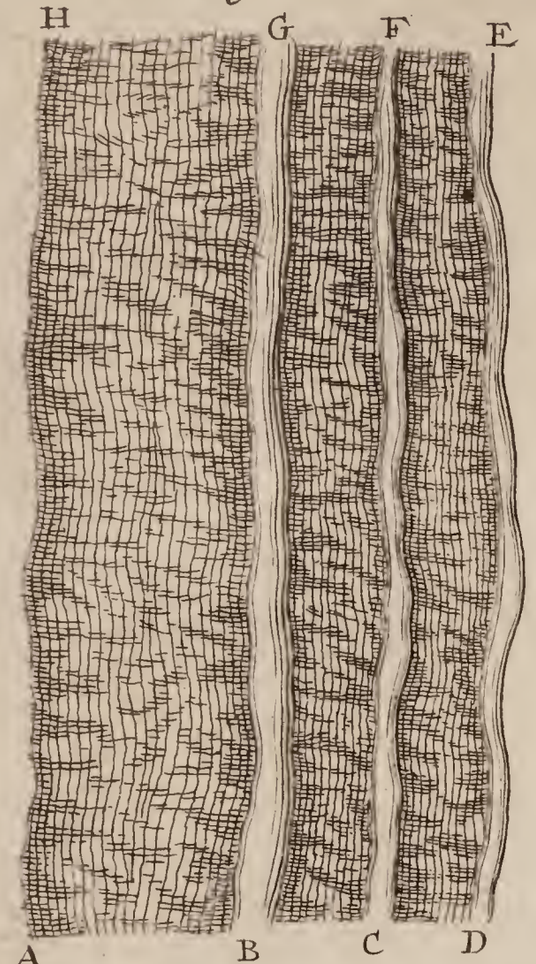


Fig 128

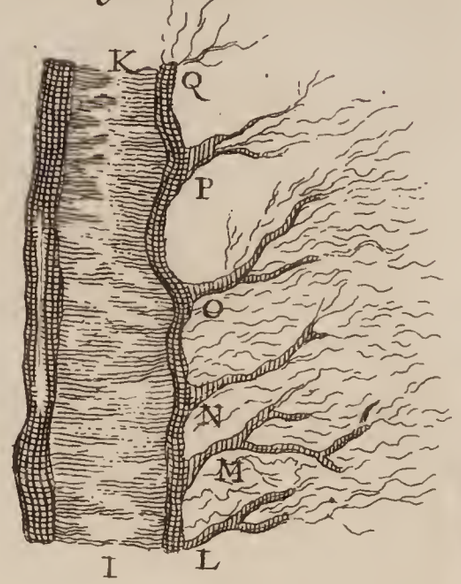


Fig. 129

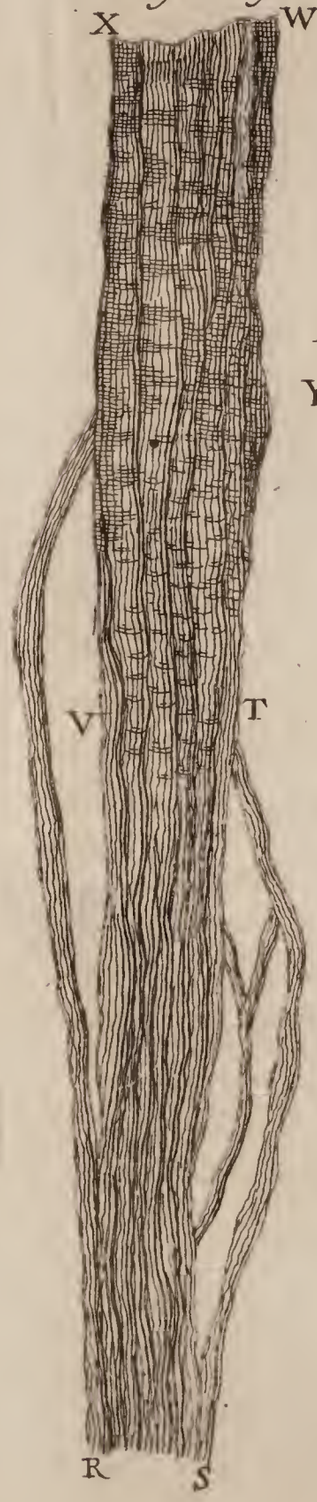


Fig. 130

Fig. 131

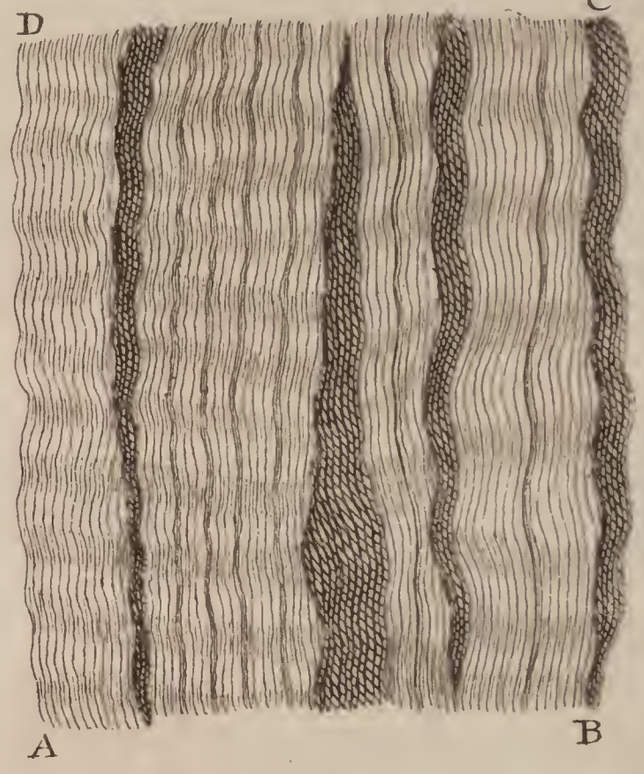


Fig. 132

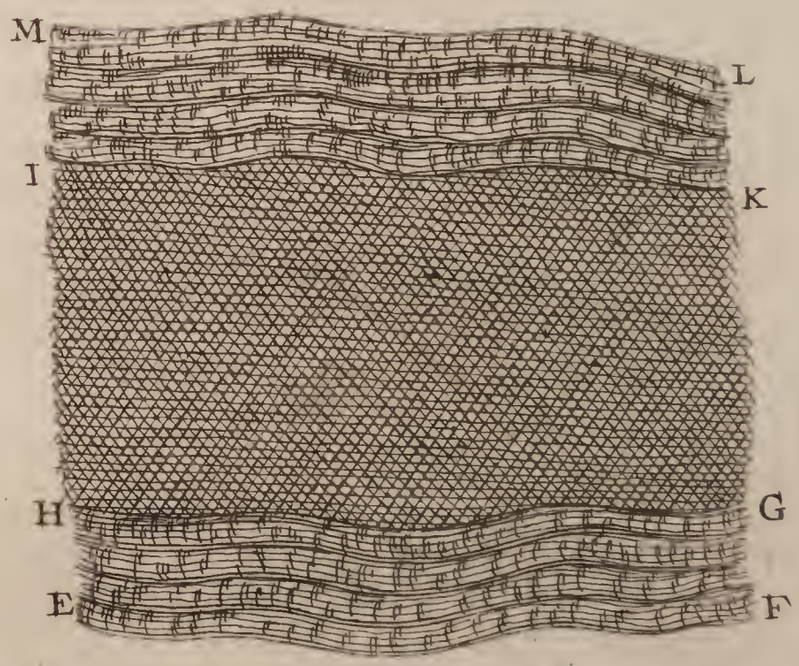
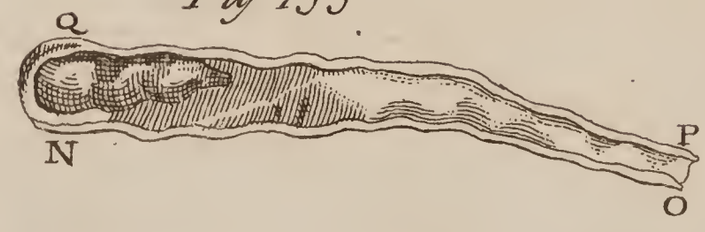


Fig 133



3. Multis ab hinc annis pro certo habui quod Diaphragma inſtrumentum ſit adeo magnum, ut totum abdomen continue moveat, quo motu cibi in ventriculo & inteſtinis adeo conteruntur, ut in materiam tam fluidam redigantur, quae apta eſt, ut intret parvula illa vaſcula ſanguinea, quae multa in inteſtinorum cavitatibus ſita ſunt: non autem per oſcula illorum vaſculorum, ut quidam hominibus perſuadere conati ſunt, ſed me judice per tenues tunicas illorum parviſſimorum vaſculorum ſanguineorum. Si jam ponamus arteriam in corpore bene conſtituto, intra horae unius ſpatium ter millies & ſexcenties pulſare, quatuorque pulſus fieri in una reſpiratione, computabimus 900 reſpirationes ſpatio unius horae, ac toties fiet preſſio ventriculi & inteſtinorum, quam voco ſubactionem in ventriculo & inteſtinis contentorum. *Continued by the ſame.* N° 380. *p.* 439.

Duos abhinc menſes varias lentas palpitationes per Diaphragma ſenſi: quare cogitabam de tuba quadam vitrea, à me inventa, ad ſpiritum cujuſdam liquoris in pectus ducendum, ut experimentum facerem, num inſolitus ille diaphragmatis motus, quem cordis palpitationem vocant, ſedari poſſet. Implevi ergo meam tubam ad altitudinem trium tranſverſorum digitorum ſpiritu vini, in quo jam diu haec aromata fuerant infuſa, nempe nuces moſchatae, macis, & parum caryophillorum, ſed cinnamomi multum, ut & croci, & inſpiravi aërem tranſeuntem per hunc ſpiritum vini, & quidem non modeſtè, ſed fortiter aërem in pulmonem impuli, quo Diaphragma quod fortis membrana eſt, valde extendebam experiendi gratia num palpitationem, vel inordinatum diaphragmatis motum, hoc facto componere poſſem, quod illo tempore bene ſucceſſit: Sed poſtea quidem evenit, ut experimentum hoc, quamvis aërem tam fortiter in pectus inducerem, ut preſſus aër cum tuſſi ex guttere erumperet, expectationem meam eluſerit.

VII. In § VI, the Author informs us of wonderful Appearances within the very Center of human Bones; for in 8 ſeveral Preparations he has, of Leg and Thigh-Bones, and others, of Men and Infants, he has obſerved plain *Chryſalis's* of Inſects, and very perfect; of different Sorts, lodged in the Cavities of the Marrow: How they come there, he can no more account for, than for whole Bundles of Worms twiſted together, which he has found in the great Artery juſt by the Heart; or for 6 fat, thick, *Erucæ* in a Sheep's Brain; and many of the like nature, that have happened in the way of his Obſervation, which are in the *Czar*'s Repoſitory. *An Account of a Book, entituled,* Adverſariorum Anatomicó Medico Chirurgicorum Decas tertia. *Auctore* Fred. Ruyſch, *M. D. Anat. & Bot. Prof.* Amſtel. *R.S.S.* No. 379, p. 428.

In § IX, he treats of human Bones, in which Search he has long laboured: He obſerves the *Epiphyſes* upon the Ends of the Bones are chiefly faſtened to them by the *Perioſteum*; which being taken off, they eaſily fall aſunder. 'Tis a Miſtake, that we vulgarly think this is done by means of an intermediate Cartilage: The Truth is, both the *Epiphyſes* and Ends of the Bones, at firſt, are cartilaginous; but in time become bony, and then are only joined by the *Perioſteum*. The

Oſſification always begins in the middle of Bones. Sometimes he has found human Bones ſo void of Cavities, that he has made Knife-handles of them: It is has been thought that cartilaginous Parts were exſanguious; but falſly, as he demonſtrates by ſeveral Preparations thereof.

CHAP. VIII.

MONSTERS.

A monſtrous double Birth in Lorrain; *communicated by Mr.* Fevry. N°. 377. *p.* 346.

ON the laſt of *December*, 1722, I went to *Domp Remy la Pucelle*, to ſee there *Sebaſtiana Camus*, aged 44 Years, delivered on the 24th of the ſaid Month, about 8 o'Clock in the Evening, of two Children or Twins, joined together, as appears by the Draughts, *viz.* There is one Head, one Neck, one Breaſt, one *Abdomen*, and two Hands on one Side; and there are as many Parts on the other; the whole being well proportioned and plump, joining together by the Belly, which is common to both, ſo that one of the Heads is in the Place where the other's Feet ſhould be, and the other Head is in it's natural Place; they have but 2 Legs for both of them, which ſeem to ariſe from the tranſverſe *Apophyſes* of the *Vertebræ* of the Loins on one Side; and from the oppoſite Region of the Loins, comes out a Leg ending with a Joint which bends forwards, and at the Extremity forms a ſmall Stump, like a Finger, articulated by *Ginglymus*. There is but one Fundament for both, by which they void their Excrements; they have but one Navel-ſtring, and the Parts proper to the Female Sex are alſo ſingle: They eat and drink with their Mouths ſeverally, and while the Breaſt is given to one, the other cries for it: They ſleep and are awake, ſometimes both at the ſame time, ſometimes ſeparately. Each of theſe Children has been baptized: One of them is ſomewhat plumper than the other, which is more puny, and not ſo freſh-coloured. The Head of the one, which is a little bigger than that of the other, came firſt to the Birth, the two Arms lying on the Breaſt followed next; the Legs lay on the Sides of the Breaſt of the ſecond; the oppoſite Leg, which is ſingle, was extricated afterwards; laſt of all, the Arms of the ſecond Child, being ranged on the Side of it's Head, made it eaſy for the reſt to come out. The Bodies of both theſe Children make no more in Bulk than that of one ordinarily does. It is obſervable, that the Mother can aſſign nothing that had had any Relation to this Event, during the Time of her Pregnancy.

Fig. 134, 135.

By another Account communicated to the Royal Society, we are informed, that theſe Children lived two Months after the Birth.

Fig. 134, and 135 were drawn in their Life-time, and the reſt were taken after their Death, by Order of his Royal Highneſs the Duke of *Lorrain.*

Fig. 134, repreſents the fore View of the Twins; 135, their Back-part; 136 and 137, the Skeleton; 138, the Breaſts and abdominal Muſcles, after the external Teguments were removed; 139, Part of the *Viſcera* of the *Abdomen*; 140, the Urinary and Genital Parts.

CHAP. IX.

Period of human Life.

I. AT *Uttoxeter*, in the Moorlands of *Staffordſhire*, 1722, in 14 Days were buried three Women; the 1ſt 103; the 2d 126, and the 3d of 87; and the ſame Year two Siſters and a Brother in and of that Pariſh; the Brother 92, the youngeſt Siſter 95, the eldeſt Siſter 98. *Examples of long Life; by* Simon Degg, *M. D. F. R. S.* No. 400. *p.* 364.

And in the ſame Pariſh this preſent Year 1726, were buried in 22 Days, the following aged People.

Aug. 7.	One Woman aged 94, and one Man aged - - -	81
Aug. 4.	One Man, aged - - - - - -	68
Aug. 19	One Man, aged - - - - -	87
Aug. 22.	One Man, aged - - - -	82
Aug. 25.	One Man, aged - - - -	83
	Men	4
	Women	2

In 1726, at *Gravely* in *Hertfordſhire*, 31 Miles from *London*, almoſt every ſixth Soul is upwards of Sixty. Inhabitants 187, aged above Sixty, 29.

II. Suos habent characteres varii aetatis gradus. A fluiditate aſcendit homo ſenſim per ſoliditatis varias mutationes, donec cum rigiditate & fibrarum veluti immobilitate amittat vitam. Nec contemnendi eſt usûs haec in medicinâ conſideratio. *The Anatomy of a decrepid old Man, aged* 109; *by* John James Scheuchzer, *M. D. F. R. S.* No. 376. *p.* 313.

Accidit ante menſes aliquot, ut ob decrepitam ſuam aetatem & raram, in Noſocomium fuerit receptus *Johannes Leonhardus Vopper*, Rhoetus, Sharanienſis ex coetu Glantino Foederis ſuperioris. Is juxta tenorem teſtimoniorum lucem primum vidit, 1. *Maii* 1614. A. 1634. Metalli foſſor in venâ ſepultus, per horas 33. ſub terrâ jacuit: Mortuo, quam vivo, ſimilior inde protractus, propter Abdominis validam, quam paſſus eſt, preſſionem, inde ab illo tempore incontinentiâ urinae laboraverat. A. 1637, iter fecerat per *Hungariam*,

riam, Turciam, Terram Sanctam, reverſus *Venetias*. Poſt A. 1639, militem egit ſub Capitaneo *Caſparo de Monte*, in ſervitiis *Caroli* Ducis *Lotharingiæ*, in ſtatu *Mediolanenſi*, & A. 1663, in *Luſitaniâ*, A. 1682, interfuit obſidioni *Viennenſi*, & in ultimo bello obſidioni *Landaviæ* & Cladi *Hockſtettenſi*. Ita vitam, per varios caſus & mille rerum deſcrimina, protraxit ſenex noſter ad Annos 109, Menſes 3.

In cadavere obſervavimus, curſoriè veluti, (non equidem licuit per temporis anguſtiam ſectioni diu immorari) ſequentia.

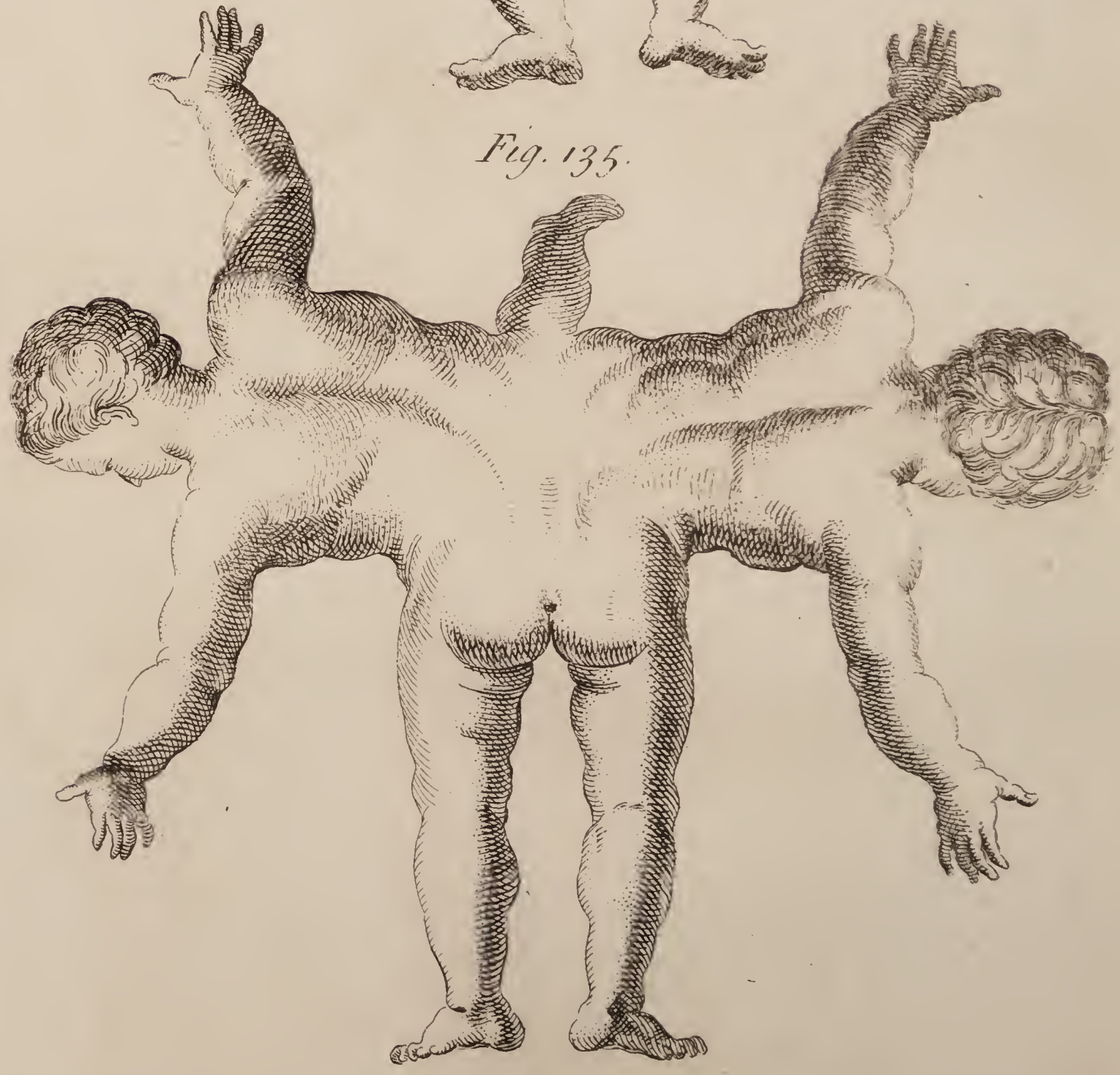
In abdominis cavo erat, parvâ quidem copiâ, ſerum ſanguinolentum extravaſatum. Inteſtina tenuia fuere omnia inflammata, rubro colore tincta, & Duodenum prae primis integrum admodum dilatatum, internâ ſui parte fracidum prorſus & gangraenoſum ; Omentum prorſus emaciatum, ut vix agnoſci potuerit : Pancreas contractum : Hepar ſanum : Veſicula fellis bile repleta : Ductus Choledochi eâdem turgidi, & tota vicinia Inteſtinorum & Meſenterii virore infecta, ut alicubi extravaſata videretur bilis, cujus egreſſum in Duodenum invenire haud potuimus. Prope Pylorum, in Ventriculi ſuperiore parte, aderat expanſio veluti flatulenta, nuce juglande major. Renes ſani, ut & Lien, cujus exterior membrana, jucundo admodum ſpectaculo, obſeſſa erat hinc inde maculis nivei candoris, magis minuſque latis, quae primo intuitu referebant puſtulas Variolarum maturas, ſed cartilagineae prorſus erant duritiei, & ultra ſuperficiem reliquae membranae aliquantum elevatae. Obſervo heic, antequam progrediar ulterius, non duntaxat rigeſcere fibras, & contrahi ſupremâ aetate, ſed tantum non inſenſiles fieri ; nemo quippe juvenilis vel conſiſtentis aetatis pateretur inflammationem Inteſtinorum, qualis haec fuit, abſque acutiſſimo dolore, de quo tamen aeger poſt ſenile delirium, quod aliquamdiu eſt perpeſſus, ad ſe ultimis vitae diebus rediens, nihil eſt conqueſtus. Cartilaginea illa Lienis cruſta manifeſto eſt indicio, poſſe ita rigeſcere membranas, ut tandem indurentur.

Thoracis apertio non parum faceſſebat laboris. Fuerunt quippe non ſolum Sterni illae coſtoſae prominentiae, aliàs cartilagineae, heic planè oſſeae, ſed & cum ipſis Coſtis tantum non continuae, indicio manifeſto, Cartilagines fieri ſucceſſu temporis oſſeas, quemadmodum membranae & arteriae fiunt cartilagineae, & ex cartilagineis non ſemel oſſeas narrant Hiſtoriae. Pulmones viridantibus paſſim maculis obſeſſi, in utroque Thoracis latere, poſticâ ſui parte affixi erant Coſtis : Pericardium amplum & multo ſero refertum, cujus & aliqua portio in cavo fluitabat Thorace. Cor ipſum vidimus ſatis amplum, imprimis Auriculas dilatatas praeter modum, & tum haſce, tum Ventriculos ſanguine concreto refertos, unde patet ſubſtitiſſe tandem ſanguinis motum, propter defectum contractionis elaſticae in tubulis arterioſis, & cordis machinam ſanguini ad concretionem diſpoſito expellendo non amplius fuiſſe ſufficientem, imo propter nimiam reſiſtentiam obrutam. Praeſtabat Tendinem illum, quo Cordi inſeruntur arteriae, vel oſſeum plane, vel cartilagineum ſaltem : Oſſeus ſane, quod novi-

mus,

Fig. 134.

Fig. 135.



mus, fit in Cervis adultioribus, unde Os de Corde Cervi. Et fanè aliquid tale offendimus, nimirum Valvulas ſemilunares, prae primis Aortae, cartilagineas penè, praecipuè mediâ ſui parte. Aortam ipſam deſcendentem obſervavimus valdè amplam, diametri duplo majoris, quam eſt Gula, Pariſini circiter pollicis. Gulae inſtratae paſſim erant Glandulae lentiformes induratae. Amplitudo illa Aortae indicat tardiorem ultimis fortè vitae annis progreſſivum motum ſanguinis, unde arteriae, quae propiores ſunt Cordi, fuere ſenſim dilatatae, ſicuti ſaepe obſervamus dilatari adeo, ubi nimia eſt molis reſiſtentia, ut in Aneuriſma abeat egrediens è Corde Arteria magna.

Pergimus ad Caput, ubi praedura Cranii ſubſtantia rurſum ſolitò majorem poſcebat laborem: Suturae, imprimis Sagittalis & Lambdoidea, erant fermè obliteratae, nec prorſus penetrabant utramque Tabulam, ut nulla fuerit per illas è cavitate illâ magnâ Capitis perſpiratio, & ſuccus ille Oſſium nutritius, inter fiſſuras Suturarum extravaſatus, factus quoque fuerit oſſeus. Foramina quidem tria quatuorve ſatis ampla, in ſupremo vertice, ad latas utrumque Sinus Sagittalis, pollicis fermè diſtantiâ ab invicem viſuntur, internam Laminam ad externam uſque penetrantia, abſque quod ullum illorum utramque perforet Tabulam. Dura Meninx triplo ferè craſſior fuit, quam eſt ordinariè, coriacea penè: Pia ſeparabatur facile, nimio utpotè irrigata ſero, a Cerebri ſubſtantiâ: Ventriculi omnes ſero erant referti, quod ſat magnâ copiâ quoque fluitabat in Cerebri baſi, imprimis ad Spinalis Medullae egreſſum. Plexus Choroides Glandulis piſalibus, lymphâ coagulatâ refertis, erat obſeſſus: Septum pellucidum egregiè poterat conſpi[illegible] Caeterum Cerebri ipſa ſubſtantia, imprimis interioris, flaccidior ſolito.

Innotuit mihi, inde ex quo obiit decrepitus noſter, retuliſſe eum perſonis fide dignis, quod pater ejus, ſeculum jam ſupergreſſus, tres genuerit liberos, & ex majoribus pauci infra ſeculi aetatem obierint. Hoc certum eſt, noſtro natam filiam *Mariam Magdalenam* ex uxore *Urſulâ Herzeliâ* de *Naniken* pagi *Tigurini*, quae S. Baptiſmatis charactere ſignata fuit *Dieſſenhovæ*, 18 Aug. 1707.

CHAP. X.

PHARMACY, CHYMISTRY.

I. 1. TRADITUM eſt in ſcriptis de Camphora editis, poſſe etiam praeter ordinariam, quam copioſam ſatis habere poſſumus, aliam ex radice Cinnamomi, Zedoaria Ceylonica, Roremarino Camphorato. *Of Camphire by Mr* Charles Neuman, Chym. Profe-

Reg. *Berolin.* F. R. S. N° 389. *p.* 321.

Camphorato, Abrotano aliisque vegetabilibus aromaticis parari, quod certo respectu negari nequit, & hac ipsa observatione mea confirmatur; nihilo tamen minus confiteri me oportet ante omnia, me nusquam locorum, quae peregrinando adivi, talem ex aliis & jam dictis vegetabilibus paratam, licet diligenter perquisitam, ne in minima quidem quantitate vidisse Camphoram, quae in solida & vere sicca consistentia cum orientali conveniret; sed quicquid hujusmodi mihi monstratum est Amstelodami, fuit illud oleum, quod in India ex radice Cinnamomi destillatum dicitur & Camphoram non minus quam Cinnamomum redolet, quamvis dubius adhuc haereo, genuinum ne illud destillatum fuerit, an oleum Cinnamomi ordinarium copiosa Camphora impraegnatum? Si quidem multa experientia comprobatum habeo, solere vulgo & imprimis in loco jam dicto, varias merces, potissimum ad rem medicam pertinentes, fuco inducto effingi, & per miscelam adulterari: sed quoquo modo se res cum isto oleo habeat, posito etiam, nihil fuci subfuisse, & ostendi posse Camphoram, etiam in solida consistentia, ex radice, & ex Zedoaria Ceylonica, aliisque orientalibus vegetabilibus elicitam, nemo tamen, quoad scio, solidum quid Camphorae aemulum ex vegetabilibus Europaeis unquam produxit; licet de Roremarino multi multa dixerint, & de aliis quoque plantis nostratibus conjectura praesumserint; imo licet etiam *D. Hofmannus* Professor *Hallensis* & *Boyle* nobilis Anglus memoriae prodiderint, quod ille simile quid ex floribus Rosarum & Ligno Aloes *, hic vero ex oleo Anisi impetraverit †, penitus tamen ego sum persuasus, quicquid Camphorae simile ex his tribus productum fuerit, molle quid & unctuosum, vel ad summum butyraceae consistentiae, minime vero siccum, crystallinum, fragile, & Camphorae duritie aemulum fuisse, id quod etiam ex ipsorum descriptionibus quivis facile potest colligere. Taceo, quod in vulgus notum est, oleum Anisi in frigore butyri instar condensari, minime vero in Camphoram eo ipso abire. Praeter haec, quae in scriptis commemorata legimus, fuerunt aliqui & in his quidam Pharmacopoeus, caeteroquin rerum suarum satagens, qui ore tenus mihi affirmarunt, posse se ex variis plantis indigenis Camphoram parare, cujus modi tamen itidem ne tantillum quidem unquam videre licuit; interim assentior illis & lubens credo, potuisse hos eâdem facilitate, qua ego meam, impetrare Camphoram.

Placuit igitur ad Inclytam Reg. Societatem referre, acquisiviisse me ex nostrati Thymo vulgari, verum, densum, crystalliformem & in omnibus qualitatibus conspirantem, nec nisi odore differentem Camphoram, quae cuncta experimenta huc usque cognita, & pro justo examine ex cogitata possibilia, aeque ac Orientalis sustinet, atque ita cum hoc in omnibus, solo odore excepto, convenit.

* *Vid.* Ejus Dissertat. de Camphora & Observat. Physico-Chym. † *Vid.* Ejus Tr. de Firmitate & Fluiditate.

Destillaveram

Fig. 138.

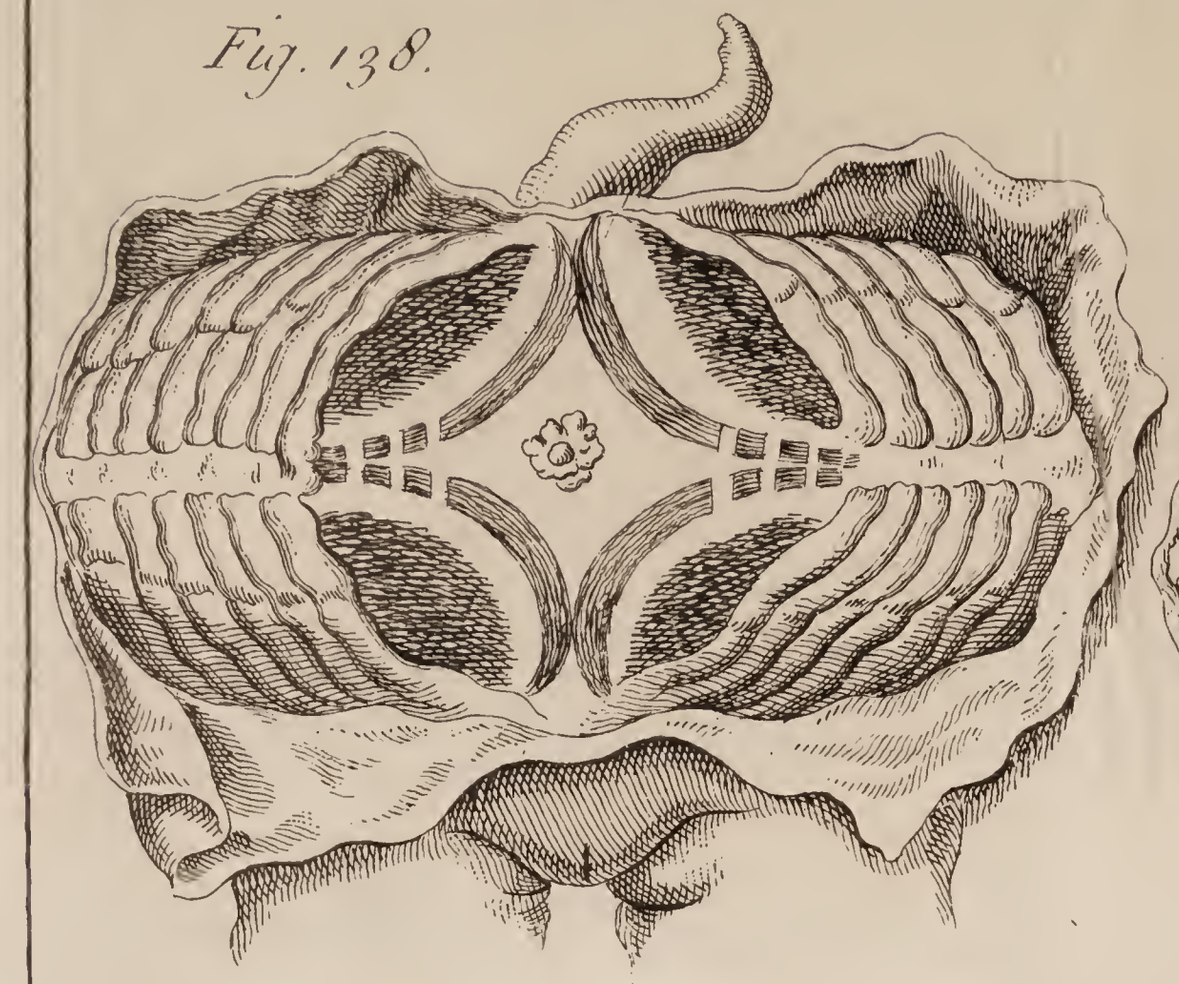


Fig. 139.

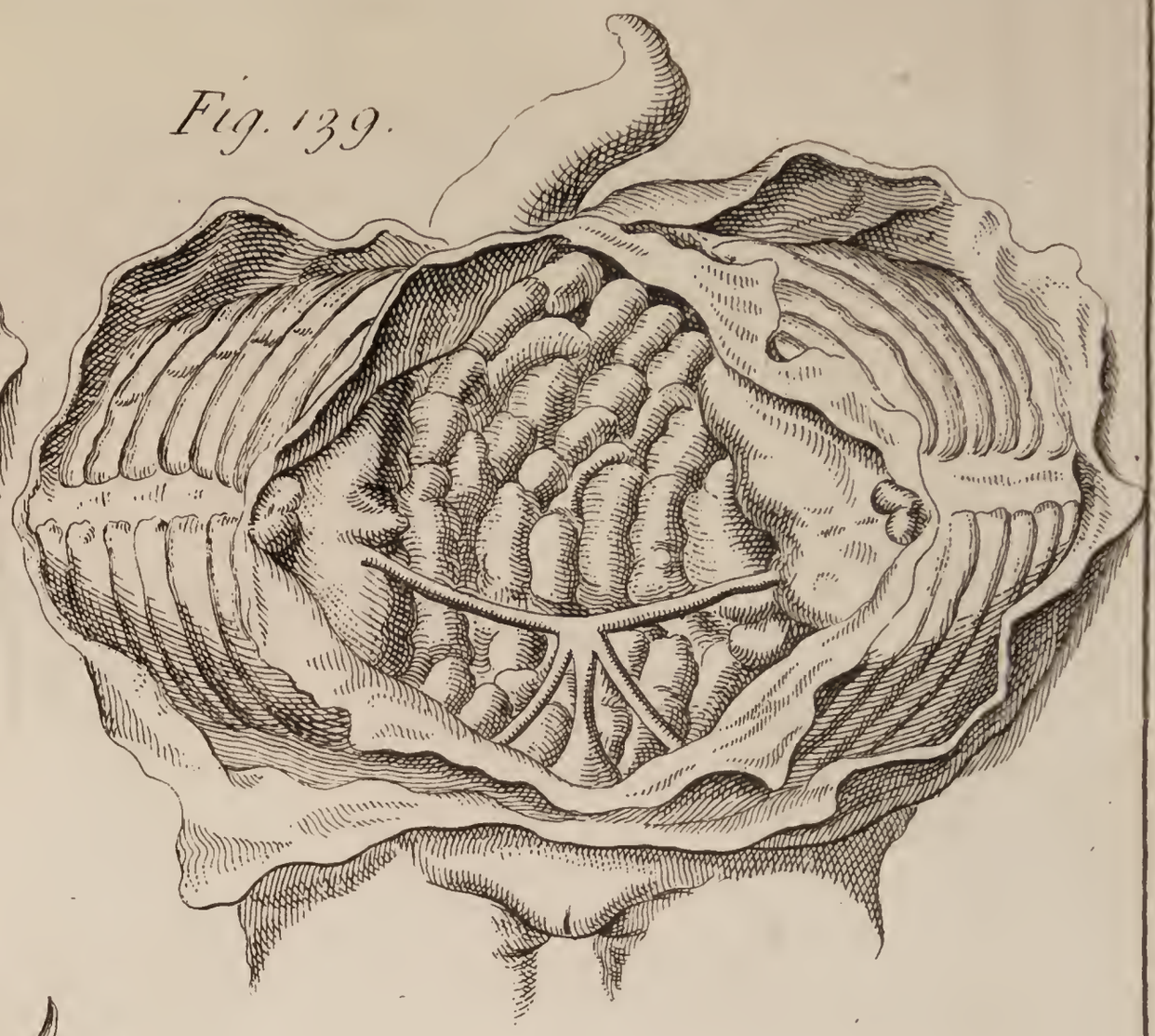


Fig. 140

Fig. 136.

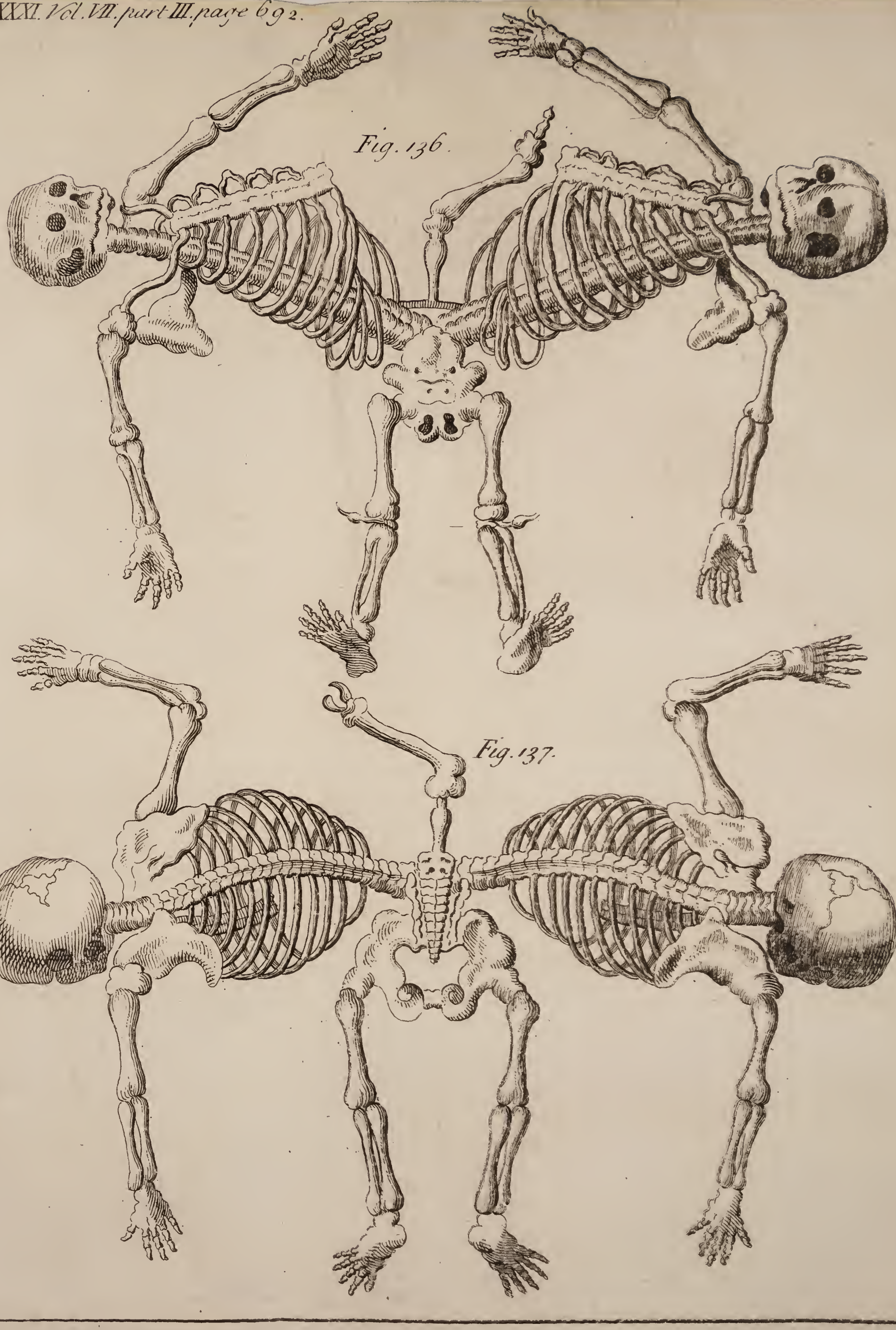


Fig. 137.

Deſtillaveram *Anno* 1719, ex dicta herba olei copiam bene multam, inſtitutaque hujus ab aqua ſeparatione cum goſſypio, cernebam tam ad orificium vitri, quam in goſſypio oleo imbuto parvos figuratos cryſtallulos haerentes, qui ipſam deſtillationem alias ſatis celerem, magis magiſque remorabantur, adeo, ut neceſſarium eſſet goſſypium, contra morem, aliquoties renovare. Mirabar quid rei novae & extraordinariae contigerit, variaſque cogitationes agitabam, parum tamen vel nihil certi ea de re unde evenerit, & quid eſſet, poteram colligere; lagenam igitur oleo plenam, bene munitam, reponebam. Interim ſemel excitatae & conceptae de rei novitate cogitationes inquietum me tenebant: quare ſciendi cupiditate ductus, poſt paucos dies, reſumo lagenam olei, viſurus, an denuo cryſtallini quid ad orificium vitri haereat, & quantulumcunque demum id fuerit, per experimenta tamen parvula probaturus, cujus indolis illud ſit, ſed circa orificium nihil ejuſmodi reperiebam circa fundum vitri vero, quod me tanto magis attentum, ne dicam attonitum habuit, conſediſſe vidi cryſtallos in ſi ſatis magna quantitate, diverſae magnitudinis, partim avellanas exaequantes, pleraſque cubiformes, ſaccharo cando ſimiles. Nondum ſuſpicabar Camphoram, ſed potius ſal volatile, quod pro copia herbae ſucceſſive ſimul tranſcenderit, & in parte aquoſa ſolutum, poſtquam haec fundum petiiſſet, purumque oleum ſupernataret, tandem ita coaluerit. Effundo igitur oleum, ut ſal, quod eſſe putabam, impetrarem, & judicii mei certior fierem. Sed denuo in admirationem rapiebar, quod ne guttulam quidem aquae in fundo invenirem, ubi conſultius nihil erat quam magma ſalinum à fundo liberare, & ab oleo ſeparatum ſervare. Quo me igitur ex dubio extricarem, vel potius, ut de ſale, quod judicando praeſumſeram, certior eſſem, tentabam experimentum quo cuncta ſalia, cujuſcunque indolis & nominis fuerint, probantur. Magnam ſcilicet quantitatem aquae deſtillatae infundebam ſuper materiam cryſtallinam, ſat diu ſimul agitabam, hinc per aliquot horas quieti dabam, ſolutionem cryſtallini per omnes horae quadrantes cupide, ſed fruſtra expectans, neque enim ſolutionem, neque ullam mutationem ejus animadvertebam, praeter quod minimae particulae in ſuperficiem elevarentur, majores vero quantumvis bene interagitatae fundum ſemper repeterent, & aqua particulis oleoſis cryſtallinae materiae adhaerentibus, ſed agitatione liberatis, impraegnata eſſet. Transfundo aquam, & nova adfuſa, denuo tentabam cryſtallorum pro indole ſalium ſolutionem, poſtquam hi ab adhaerente oleo, quod forſan ſolutionem ejus in aqua impediret, liberati eſſent, ſed pertinaciter ſolutioni renitebantur, quam neque adhuc dum, ſaepius licet tentatam, admiſerunt. Dehinc, praeoccupatione de ſalino concremento plane abjecta, conjecturare cepi, quod plane quid aliud, ſcilicet mixtum oleoſum, vel quaſi reſinoſum volatile ex oleo condenſatum eſſe debeat. Hoc mecum perpendens, ſub examen revoco varia, alias vere exiſtentia, mihique nota ſubjecta, ſi quod eorum cum novo hoc comparari queat, & mox ob ſimilitudinem cogitabam Camphoram. Sine

mora igitur nova quaedam, per quae me magis certum de re fore ſperabam, adornavi, & eccè rei certus eram, ſi quidem omnia quae modo feci experimenta, non alia quam quae communis Camphora ſuppeditat, Phaenomena exhibuerunt, unde tandem, utpote veritatis convictum, nullo plane dubio relicto, concludere me oportuit, corpus hoc cryſtalliforme aliud nihil quam veram eſſe Camphoram, quae ab Orientali non niſi in eo differat, quod haec Thymum, illa verò aliud vegetabile redoleat, quod, quia Camphoram copioſam ſuppeditat, huc uſque nullo alio quam arboris Camphoriferae nomine indigitatum fuit.

Ex his omnibus ſequentia mihi concepi dogmata, quae ulteriori cujuſvis indagationi, cum libertate ſentiendi, proponam.

I. Nomen hoc Camphora, vel Caphura, non ſpeciale, ſeu proprium eſt, quod uni ſoli ex India venienti Camphorae ſemper competat, ſed pro generali, ſeu appellativo potius haberi debet (uti *v. g.* nomen ſalis, olei, aquae, ſpiritus, &c.) ita ut pro diſtinctione ſpeciei Camphorae nomen illius vegetabilis addatur, ex quo parata eſt, ſicuti mea Camphora jure meritoque Camphora Thymi dicenda venit.

II. Sub hoc nomine Camphorae concepta ceſſat omnis controverſia inter autores hactenus agitata de ſpecie, ad quam Camphora pertineat, ſi quidem neque reſinis, neque ſalibus volatilibus, neque oleis & ſuccis accenſenda eſt, multo minus ad gummi vel bitumina referenda, quod cum his omnibus per omnia non conveniat, ſed jam in hac, jam in alia qualitate, jam plus, jam minus praecipui, vel tamen plane diverſi quid habeat.

1. Reſina dici nequit, quia, quod etiam jam *Hofmannus* adnotavit. (a) *Omnes reſinae poſt combuſtionem, cineres, vel aliud terrei aliquid relinquunt, Camphora è contra plane nihil, ſed tota deflagrat & in auras avolat.* (b) *Nullae reſinae in vaſe clauſo penitus & in totum elevantur ab igne, ſeu ſublimantur, quod tamen cum Camphora ſuccedit.* (c) *Reſinae, ubi deſtillantur, phlegma praebent, & oleum, partim etiam ſpiritum ſic dictum, Camphora vero horum nihil.* (d) *Nulla plane reſina eſt, quae ad inſtar Camphorae in ſpiritu nitri ſolvi queat* (e) *Nec ulla datur, quae aeque cito & in tanta copia in ſpiritu vini colliqueſcat, neque* (f) *Talis, quae in aqua calida Camphorae inſter avolet.* 2. Multo minus Camphora ſal volatile dici poteſt, quia in aqua non ſolvitur, nec cum aqua intime, quin videri poſſit, miſcetur, quam tamen ſolutionem inviſibilem cuncta ſalia admittere debent neceſſario, uti ſupra jam commemoratum eſt. 3. Quamvis autem Camphora oleoſum mixtum, vel ex oleo condenſatum corpus ſit, ideo tamen ſimpliciter oleum vocari nequit, aeque ac alia mixta ſolida oleo pragnantia, ſiquidem olei nomen liquidis praecipue, vel ad ſummum tenuiter unguinoſis, minime verò ſolidis & ſiccis ſubjectis tribuitur & convenit ; neque ullum oleum in ſicca ſubſtantia, ceu Camphora, ſublimari poteſt. 4. Succi nomen Camphorae non convenit, quia ſucci proprie dicti mixtionem. (a) *Vel gummoſam, quae in aqua facile totaliter liqueſcit,* (b) *Vel gummi-reſinoſam, quae partim in aquoſo, partim in oleoſo, inflammabili, ſpirituoſo,*

ſpirituoſo & ſimili ſolvitur, (c) *Vel reſinoſam obtinuerunt, qui poſteriores reſinae propriae dicuntur, de quibus jam ſub numero* 1. *dictum eſt, quarum proprietatum nulla Camphorae convenit. Nam ſi omnia ea, quae ex arboribus aliiſque vegetabilibus partim ſponte proveniunt, vel à natura & ſolae, partim etiam per artem parantur, quamvis in tota planta ejuſque ſucco & partibus aliis diſperſa & commixta fuerint, ſuccos vocare quis vellet, quantam non confuſionem ineptam & conceptu impoſſibilem pareret in deſcribendis rerum eſſentiis? Sic enim omnis aquae, ſucci, gummi, olei, balſami, reſinae ſimiliumque diverſitas plane periret, verbaque haec diſtinctiva nullius plane uſus forent.* 5. Camphoram etiam gummi vel bitumen non eſſe, ex prioribus jam ſatis apparet, quicquid enim gummi vocatur, penitus in aqua colliqueſcit, ſicuti bitumina maximam partem in ea ſolvuntur, ambo vero ſublimationi refragantur, quam Camphora tamen admittit. Cum igitur nihil in orbe terrarum cognitum ſit, quod cum Camphora comparari poſſit, aequum etiam eſt, ut ſuo quoque nomine ſingulari & ſpecifico inſigniatur, per quod, ſi res quaedam dicatur Camphora, ſtatim intelligatur, eam neque oleum, neque gummi, ſal volatile, reſinam, ſpiritum, neque bitumen, ſed plane aliam & à dictis his diverſam eſſe materiam, mixtum nempe ex ingredientibus, Camphoram veram conſtituentibus, concinnatum, indolis ſpecialiſſimae. Unde quaeſtio, an ſal, vel gummi, reſina, vel ſuccus ſit, aequae inconveniens & ſupervacanea judicabitur, ac ſi quis quaerere velit, an ſal ſit oleum, vel an gummi ſit Camphora.

III. Ex prioribus deduco, quod omnis Camphora certum ſuum ſpecificum odorem, & quidem oleum illius plantae, ex qua parata eſt, conſtanter retineat, quodque odor iſte ſine deſtructione totius Camphorae ſeparari ab ea nequeat.

IV. Conſequitur, quod experimentum noſtrum de Camphora Thymi orientalem Camphorae fabricationem ſatis ſuperque confirmet, nempe quod deſtillando paretur, & acquiratur, in quo negotio vix alia intercedit diverſitas, quam quod ex ſic dicta arbore Camphorifera ibidem in magna copia & ita longe plus Camphorae quam olei haberi queat, cum è contrario vegetabilia *Europaeorum* plurimum olei, parum vero Camphorae largiantur.

V. Certo credere poſſimus, alias quoque plantas *Europaeas*, copioſo oleo eſſentiali pregnantes, aeque ac Thymum, Camphoram daturas eſſe, quamvis nullam adhuc viderim, neque pro ea elaboranda juſtam occaſionem nactus fuerim, vel otio abundarim.

VI. Tandem ſi qui fuerint, qui plane ſingularem vel peculiarem Camphorae indolem diſtincte nequeunt concipere, & ex quibus denique conſtet, ſcire velint, in horum gratiam pro mea quidem qualicunque experientia, amice mentem meam ita declarabo; quod Camphora ſit ſiccum quid, album, pellucidum & fragile, valde acute olens, non ſolum in igne, ſed etiam in aëre ſubcalido prorſus volatile corpus, quod ratione mixtionis, ex copia principii inflammabilis

rarefacti, pauca aquositate, & summe attenuata vel subtilissima terra, intime inter se unitis constat. 1. Constat Camphora rarefacto Phogisto, quia non solum cito & tenuiter, imo etiam in aqua & nive ardet, sed etiam cum aliis de eodem principio copiose participantibus celerrime unitur, ex quibus spiritus vini commemoratione, nitri vero spiritus meditatione digniſſimus est, siquidem de posteriore pauciſſima sunt cognita. 2. Aquosi aliquid continet Camphora, cum alias principium inflammabile, licet copiosius, flammam exhibere non posset. 3. Terram subtilem nemo negabit, quia extra hanc siccum corpus crystallinum non sisteret. 4. Aeque minus in dubium vocabitur, terram hanc subtiliſſimam, & cum coeteris intime, perque minimas, quas vel cogitando concipere possumus, partes unitam esse, si perpendimus, quod Camphora in solo aëre, aliquantulum tamen subcalido in tota mixtura sua, plane nihil post se relinquendo, avolet.

Definitio haec per ea ipsa, quae hactenus de Camphora Thymi diximus, confirmatur, considerando, quod ea solummodo ex subtili oleo essentiali ortum duxerit, in quo oleo itidem non alia, quam superius dicta tria constituentia, phlogiston, aqua & terra demonstrari possunt, quamvis sub notabili hoc discrimine, quod 1. Camphorae mixtura multo subtilior quam olei, quinimo (si ita loqui liceat) quinta essentia, & extractum olei sit. 2. Camphora parum saltem aquei principii in sui mixturam recepit, oleum vero intuitu hujus longe plus. 3. Terra Camphorae summe attenuata, & adeo subtilis est, ut sponte simul cum coeteris constitutivis avolet in auras, cum contra terra olei multo est crassior, id quod etiam, ut alia taceam, in rectificatione vel exhalatione olei videre est, ubi primo resinae vel bituminis instar, tandem etiam crassiori specie apparet.

Quod superest, dissimulare non possum, haec aliaque experimenta de Camphora facta dubium me habere, an etiam ullo alio quam destillationis modo Camphora acquiratur. Prae coeteris, de veritate suspecta mihi videntur, quae de collectione Camphorae in Insula *Borneo* asseruntur ; dicunt vero quod ibi locorum sponte Camphora instar gummi, vel resinae, ex arbore exsudet, atque ita ab incolis colligatur, multo pretiosior quam Japonica, quaeque prae raritate tam cara habeatur, ut incolae illius insulae nihil ejus concedant exteris. Sed quoquo modo res cum hac traditione sese habeat, justas tamen de ea dubitandi causas habeo, & in his potissimum Camphorae volatilitatem, naturae ejus penitius insitam ; namque si ex arboribus exsudaret, non adeo diu sub sole fervidiore, quo terrae illius climatis incalescunt, persisteret, sed sat cito in aere libere exhalando fugeret, idque tanto facilius, quia cum exsudaret, multo liquidior esse deberet, nec consistentiam Camphorae duriorem habere posset, quae vero liquiditas ad tanto celeriorem exhalationem disponeret, si quidem per se Camphora in molli vel liquida consistentia retineri plane non potest cum accepto calore, & ubi colliquescit, mox avolat, qua de causa etiam cum resina comparari nequit. Quod vero Camphora nativa,

ad inſtar diſtillatae, in oleo ſuo diſtillato quaſi ſoluta ex arbore profluat, & dein ad arboris corticem Cryſtallorum in modum concreſcat, tanto minus ut credam aducor, cum pauca vel nulla potius exempla comperta ſint, quod natura olea diſtillata eſſentialia, aliaque arte facta, inſtrumentis debitis quippe deſtituta, produxerit. Et parum abeſt, quin credam totam traditionem de tali collectione Camphorae non niſi ex auditu commemorari, & viros coeteroquin eruditos *Ten Rheine*, *Breynium*, *Hermannum* coeteroſque, alium ex alio tranſcripſiſſe, nullum vero, quantum credere par eſt, rem oculis in arbore ipſa conſpexiſſe, quae quidem fallacia in Hiſtoria naturali prima non foret. Hinc deinque concludo, eſſe omnino hanc ſpeciem Camphorae tam raram, ut eam oculis cernere nemini liceat, nec forſan unquam contingere queat.

2. In tractu praecedente, inter alia Scriptor haec aſſerit. " Acquiſivi ex noſtrati Thymo Vulgari verum, denſum, cryſtalliformem, " & in omnibus qualitatibus conſpirantem, nec niſi odore differen- " tem Camphoram, quae cuncta experimenta huc uſque cognita, & " pro juſto examine excogitata poſſibilia, aeque ac orientalis ſuſtinet, " atque ita cum hoc in omnibus, ſolo odore excepto, convenit. " . . . . Quibus verbis paulo poſt ſubjungit, " ſe hanc Camphoram ex " Oleo Thymi deſtillato obtinuiſſe." . . . Haec ille : de quibus non inutile erit pauca obſervare.

Of the ſame, by Mr John Brown, *Chymiſt, F. R. S.* No. 390, pag. 361.

Primo mihi animum ſubit, Quoddam apud nos eſſe eodem modo è noſtrati Thymo deſtillatum, quod hactenus improprio Salis Thymi Volatilis nomine dictum fuit : non tamen video quomodo Camphora Thymi verius dici poteſt. Equidem non in dubium voco quod ex propria experientia aſſeruit Vir Doctus de eo, quicquid demum ſit, quod è Thymo extraxit, quodque appellat Camphoram : Liceat tamen mihi, pace viri eruditi, paucis, notare differentias, quas ipſe obſervavi inter Camphoram proprie dictam, & illud quod è Thymo apud nos deſtillatum habemus.

Praeparatio noſtra eſt hujus modi : Oleum Thymi coagulatum ſeu condenſatum, pellucidum, cryſtalli formâ indutum, variae magnitudinis, variaeque figurae, poſt primam ſeparationem ſaccharo candoalbo, mox vero rubro, ſimile ; valde Thymum ſpirans, pungentis vel etiam cauſtici ſaporis, non fragile ut Camphora. Hoc in quibuſdam experimentis à vulgari Camphorâ, qualis in officinis venditur, non multum differre fateor. Eâdem ſpecifica gravitate videntur eſſe. Neutrum horum in aquâ ſolvi poteſt. In Spiritu Vini ambo facile ſolvuntur. In aliis vero Phaenomena adeo ſunt diverſa ut mea ſententia nomen Camphorae utrique competere non poſſit. (1.) Camphorâ in Spiritu Vini ſolutâ & poſt in aquam projectâ, ſubito coagulum album ſupernatat, quod reverâ apparet eſſe Camphora, odore, ſapore, & ſubſtantia. Quod ſi eadem in oleo noſtro coagulato experiri velis, videbis in aquae ſuperficie guttas parvas olei liquidi innatare, que ſenſim in cryſtallos planos (cryſtallis Lunae non multum

multum abſimiles) formantur, etiamque ſaporem & odorem Thymi retinent. Diverſitas adhuc magis è ſequenti experimento comparuit. Utramque mixituram ſupradictam tota nocte in aëre frigido expoſui: Mane coagulum, quod prius Camphorae in Spiritu Vini ſolutae innataſſe dixi, prorſus evanuerat, aquâ Camphorae odorem adhuc retinente; (forte propter ſpiritum vini admixtum:) in altero vero, nempe Oleo Thymi coagulato, cryſtalli aquam ſupernatantes, in eodem ſtatu, quo antea fuerant, remanebant, nec quidquam erant diminuti. (2.) Camphoram ſolidam per vim ſpiritus nitri in liquorem pellucidum mutatum iri, quis in re chymicâ vel minime verſatus non novit? At oleum noſtrum coagulatum, ſi eidem menſtruo adjiciatur, priſtinam quidem formam cryſtallinam penitus amittit, & ſubſtantiae reſinoſae ſeu gummoſae formam induit, neque, quantumvis vaſculum, in quo continetur, validâ manu & ſaepe concutias, unquam in fluidum evadet. Preterea ſi liquorem illum pellucidum, in quem Camphora redacta erat, in aquam poſtea effundas, redintegratur Camphora: contra, oleo noſtro coagulato eadem ſubſtantia reſinoſa, ſeu gummoſa, adhuc manet, & ſapor Thymi adhaeret cum notabili amaritudine adjecta. (3.) Oleum Vitrioli (ut docuit Boyleus) Camphoram in totum diſſolvit: in Oleum vero Thymi coagulatum, quod ſupra deſcripſimus, nullam aliam mutationem inducit, niſi quod vi manûs concutientis cryſtalli in minores partes dividantur; & hoc modo cryſtalli olei, ſi microſcopio obſerventur, fragmentis Camphorae ſe magis aſſimilant. Inſuper Camphora Oleo Vitrioli ſoluta ſe ab hoc menſtruo recuperat, ſi poſtea in aquam fundatur: noſtrum vero eandem formam cryſtallorum, quam in Oleo Vitrioli habuit, etiamſi in aquam effundas, una cum ſapore & odore Thymi, adhuc retinet. (4.) Scribit D. *Neuman Camphoram conſtare rarefacto Phlogiſto* at minime quidem noſtrum: nam ſi igni admoveatur, extemplò colliqueſcit, & oleum liquidum fit. Fatendum quidem eſt, ſi goſſipium immergas, idque deinde igni admoveas, flammam ſtatim concipit: ſed hoc goſſipio deberi clarum eſt, idemque oleis omnibus commune. (5.) Ignis in duo iſta corpora diverſos effectus habet. Nam qualiſcunque ignis gradus idoneus eſt ad ſublimandam Camphoram ſine ulla liquefactione, idem corpus hoc è thymo deſtillatum & condenſatum prorſus liquefaciet, & liquefactum tenebit cum nulla vel minimâ ſublimatione. Hactenus de differentiis. Quibus, non abs re fuerit teſtimonia quaedam de oleis coagulatis, ſeu ſalibus ex oleis natis, huc pertinentia, ſubjungere. D. *Slare*, in Philoſophicis Actis, ab hinc pluſquam triginta annis editis, oleum noſtrum hiſce verbis deſcribit, Ex ſatis magnae copiae Thymi deſtillatione, ſeparatum eſt ſal volatile indolis ſingularis, (quod Peritiſſimus noſter Chymicus D. *Moult* primum mihi exhibuit) hoc eſt pellucidum, vel cryſtallinum, quoad gravitatem ſuam ſpecificam paulo aqua ponderoſius, idemque & ſal & oleum in uno corpore coagulatum eſſe videtur: in aqua non ſolvitur, ſed calefactum facile avolat.

Idem Vir Doctus ſe Oleum Cinnamomi viginti annos aſſervaſſe dicit, & intra ſex annos poſtremos, ſingulis annis quoddam ſalis praecipitatum fuiſſe, & hoc ſine ullo additamento aut arte ad ſalis formam inducendam. Sed quoad hujus ſalis naturam, an ſimile fuerit ei, quod ex Thymo deſtillatum oſtendit D. *Moult*, ſilet.

Helmontius equidem de ſale ex eodem oleo, arte facto ſic locutus eſt. " At quando oleum Cinnamomi ſuo ſali Alkali miſcetur, abſque " omni aqua, trium menſium artificioſa occultaque circulatione, to- " tum in ſalem volatilem commutatum eſt ; " etiamque in alio loco modum, quo oleum Cedri ſalis naturam aſſumat, vi menſtrui ſui Alkaheſt, docet, additque haec verba, " ſeſe permiſcebit aquae.

Cl. *Boerhavius* (ſi modo Chemiae inſtitutiones ejus nomine nuper editae, genuinae ſunt) ſic ſcribit, " Diu aſſervata olea pretioſiſſima " aromatum orientalium, vaſis bene clauſis, mutantur in ſalem, ſeu " ſaponem ; ſed experimentum non facile imitari poſſumus, nam " docente *Hombergio*, demum fit per multos annos, & dicuntur tunc " aquae miſceri."

In alio loco cum D. *Neuman* conſentire videtur *Boerhavius*. " Camphora eſt nil niſi oleum per deſtillationem concretum in gle- " bam pellucidam ; nam non eſt progenies ſolius arboris Campho- " rae, ſed omnes plantae aromaticae Camphoram ſui generis produ- " cere poſſunt ; " & paulo poſt " Oleum quod in inſula Ceilon & " alibi ex ſemine Cardamomi fit, fere totum in Camphoram muta- " tur, quod idem verum eſt de pluribus oleis ibi natis." At vero ante 6 vel 4 dies olea varia in India deſtillata, qualia ſunt oleum ex cortice Caryophyll. & Calam. aromat. & radicibus Caſſumun. & ſimilia perluſtravi ; atqui nullam in his materiam condenſatam ſive coagulatam reperire potui, quamvis pluſquam 10 annis hic recondita fuiſſent. Neque dicere poſſum cum D. *Geoffroy* jun. (*Memoires de l'Academie Royale* 1721) me unquam obſervaſſe cryſtallos ex Ol. Terebinth. vel Majoranae, parietibus vaſium, in quibus aſſervata fuerant, adhaerentes, ſimiles cryſtallis Camphorae ; quamvis vaſa multos annos his uſibus applicata diligenter inſpexi.

Quod ad hoc ſal, ſeu oleum coagulatum Thymi attinet, idem aliis in hac urbe, in re chymica verſatis notum eſt ; nam hujus parvam quantitatem (niſi quod colore ſit candidiore) noſtro ſimilem vidi : at in nullis aliis oleis aliquid hujus generis me vidiſſe memini, niſi forte mihi perſuadere liceat, ineſſe hoc tempore in ſuis principiis, (ſi ita dicam) in oleo Macis, à nobis ab hinc jam quindecim menſibus deſtillato, cujus olei eliciendi haec eſt narratio.

Satis magnam quantitatem Macis pro una operatione recepi, totoque die deſtillavi ; at minore olei quantitate elicita, quam expectabam, altero die, & etiam tertio, pro re nata, deſtillationem reiterare inſtitui : Quantum memini, quarto die, poſteaquam oleum aquam ſupernatans ſeparaveram, viſus eſt mihi alius liquor, cum aqua non permiſtus, vaſis ſeparatorii fundum petiiſſe ; hoc etiam educto, inveni

eſſe

esse oleum Macis, aqua ponderosius : ita ut ex eadem planta, eademque operatione, oleum dispari gravitate extraxerim. In superiore parte hujus olei, aliquid crystallinae formae hodie fluctuare videtur, attamen cujus generis sit substantia, sive Camphora, sive non, tempus docebit.

P. S. Postquam differentias inter nostrum oleum Thymi coagulatum & Camphoram orientalem supra descripseram, *Johannes Maud*, Chymicus, ostendit mihi oleum Majoranae coagulatum, quod nuper, & inopinato in vase, (in quo oleum Majoranae quinque annos asservatum fuerat) invenit.

Hoc oleum coagulatum Majoranae etiam eadem experimenta, cum oleo nostro Thymi coagulato, subire volui, quod & factum est, & multum inter se convenire reperiebam, ita ut hoc nihilo magis, quam nostrum, nomen Camphorae mereri, satis sciam.

Of fixed Alkaline Salts; by Mr Charles Neuman, Chym. Prof. Reg. Berolin. *F. R. S.* N° 392. *p.* 3.

II. 1. Mixta jam consideranda ut plurimum *Salia Alkalina*, *Salia fixa*, vel *Salia lixiviosa* appellantur. 1. *Salia lixiviosa* audiunt, quia per elixationem acquiruntur. 2. *Salia* vero *fixa* dicuntur, quoniam maxima ignis vi nec volatilia redduntur, neque in sublime feruntur vel abiguntur. 3. Quicquid per *Alcali* denominationem intelligitur, non adeo ignota etiam res est, nempe oppositum acidi, vel quod idem est, *antacidum.* Origo autem nominis hujus ab arabico *Alcali* derivatur; *Kali* significat Sal, & *Al* praefigitur, quemadmodum in Gallica lingua articulus definitus *le*, *la* ; itaque *Al Kali* conjunctim *le Sel* denotat. Notum insuper est, quod & herba quaedam reperiatur, *Kali* dicta, in locis maritimis crescens, multoque sale scatens, à *Lobelio* etiam *Soda* nuncupata, quae si comburitur & elixatur, ingentem salis copiam praebere solet, quod olim simpliciter *Sal* adjecto Arabico nomine *Alcali* appellatum fuit. Cumque hoc ipsum sal combustioni etiam aliarum herbarum & vegetabilium forte ansam dederit, & sales inde prolecti ejusdem fere indolis & naturae reperti fuerit, credibile admodum est, veteres, modo dicti salis originale nomen ideo retinuisse, & hoc illudve aeque *Alcali* appellasse, & tantum tractu temporis, ad meliorem distinctionem, hoc vel illud cognomen adjectum forsitan fuisse, ita praeter *purè Salia Alkalia*, corpora etiam *terrestria Alkalia* innotuere ; prioribus, pro nostro nunc scopo nobis inservientibus, ad distinctionem terrestrium, latinam denominationem *Salis* adjecerunt, & hocce in aqua solubile mixtum *Sal Alcali*, vel in genere *Salia Alcalia* appellarunt, ne forte sola vox *Alcali* aequivoca evadat, vel ad significationem ambiguam, inter *Salinum* vel *terrestre Alcali*, occasionem praeberet.

In genere autem de appellatione monendum, non satis exprimendi efficacem esse denominationem, sive solum *Salia Alcalina*, sive *Salia fixa* solum vocentur, quoniam utrumque nomen sensum iterum suggerere potest aequivocum: etenim primo habemus *& Salia Alcalia volatilia*, & secundo *Salia fixa*, quae non *purè Alcalina*, sed *Salia* dicta *Neutra* constituunt: Quamobrem securius erit, praeparata ista nunc

considerandа

conſideranda ambobus ſimul inſignire nominibus, puta *Salia Alcalina fixa* eadem appellare.

Caeterum nobis ſufficit ſcire, quod voce *Alcali* oppoſitum *Acidi*, per nomen *fixum* vero aliquid, quod conſtans in igne ſit, & per maximam ignis torturam, ita per ſe, non penitus deſtrui vel auferri poſſit, intelligatur, & quod in toto orbe, a multis retro ſeculis, in hodiernum uſque diem uſui ceſſerit, ſalia ejuſmodi, ad diſtinguendum voces in chymia, ita nuncupare & ab aliis ſalibus diſtinguere. Parum denique refert chymico practico, num voces ejuſmodi Arabicae, vel Chaldaicae, vel alii omnino linguae originem debeant, modo verſus alios artis peritos loquendo vel ſcribendo mentem ſuam explanare poterit.

Originarium Alcali hodie quidem adhuc conficitur, ſed non ex unica herba *Kali* vel *Soda* tantum, ſed ex aliis ſimul ad maris littora creſcentibus, nec ſale deſtitutis herbis. Cum vero maximam partem ſalis hujus Soda vel *Kali* forſitan porrigat, ideo ſub nomine Sodae, & cum copioſiſſime in Hiſpania alitur & praeparatur, ſub cognomine *Sodae Hiſpanicae* exportatur, venditur & conſumitur.

Quemadmodum vero *Kali* hocce non parum de ſale marino participat, cum quo, uti dictum, & aliae herbae permiſcentur, totaque incineratio & ſubſequens praeparatio non adeo circumſpectè, ſed ſolummodo ab hominibus plebeiis ejuſmodi locorum accolis peragitur; itaque ultro apparet, quemadmodum & re ipſa conſtet, *Alkali* hocce vel Sodam minime purum chymicum, ſed aliis ſalibus & impuritatibus, ut & abundanti terra conſpurcatum Sal Alkali exhibere: Quare & noſtris hiſce temporibus nec chymiae, neque medicinae, ſed ſolummodo mechanicis artificibus & opificibus, maxime vitriariis, ſaponum confectoribus & tinctoribus inſervit. Si quis vero, hiſce non obſtantibus, illo ad chymicos labores uti vellet, tunc depuratione neceſſaria & ſeparatione earum, ad Sal Alcali purum haud pertinentium, impurarum & peregrinarum ſive admixtarum, ſive caſu introductarum rerum omnino indiget. Haecce omnia, occaſione originis vocis Alkali, paucis praemittere volui, ad proprium ſcopum nunc reverſurus.

The Properties of pure fixed Alkaline Salts.

Sal Alkali-fixum purum primo quatuor proprietates Alkali, cujuſdam in genere poſſideat neceſſe eſt, quibus & ſalia Alcalino-Volatilia ſtipata ſunt. 1. Ut cum acidis quibuſvis efferveſcat. 2. Ut cum acidis hiſce in Sal medium abeat. 3. Ut omnes cum acidis factas ſolutiones praecipitet. 4. Ut coeruleum ſyrupi violarum colorem in viridem tranſmutet. Sal Alcali-fixum contra in ſubſequentibus proprietatibus à volatilibus Alcalicis ſalibus quam maxime diſcrepat, nempe quod 1. Solutionem Mercurii ſublimati non in album, quod ſalis Alcali volatilis indoles eſt, ſed in fuſcum, citrinum colorem praecipitet. 2. Cum cupro adjecto nec veſtigium coloris coerulei excitet. 3. Cum Spiritu Nitri fumum haud producat. 4. Aquae admixtum, non frigoris, ſed potius caloris ſenſum illi conciliet. 5. Ab aëre admiſſo haud ſiccum relinquatur, ſed humidum evadat, vel denique liqueſcat. 6. In igne non avolet, ſed permaneat, candeſcente

ſuaviter igne fere nihil, ingenti vero & fuſorio, parum admodum de pondere ſuo amittat. 7. Non ſolum in igne fixum perſeveret, ſed etiam cito ſe fundi patiatur, & denique. 8. In Cryſtallos haud abeat quemadmodum ſalia nonnulla volatilia. Praeterea Sal Alkali fixum purum, etiam ſubſequentes qualitates peculiares poſſidere, & in tentaminibus monſtrare debet. 1. Ut in forma ſoluta, cum alio, circa quod occupati ſumus, puriſſimo ſale Alcali-fixo, abſque ulla alteratione, turbatione vel praecipitatione, amicabiliter coëat neceſſe eſt. 2. Ut Sulphur in humida via, aeque ac ſicca, omnino ſolvat oportet. 3. Cum Acido vitriolico puro permixtum, & in ſal medium cryſtallinum coactum, in igne nihil ponderis ſui amittere, nec ullo modo fluere debet. 4. Denique purum & genuinum ejuſmodi Sal Alcali-fixum, praeter reliquas omnes antea recenſitas 15 proprietates, cum pinguibus etiam vel expreſſis oleis ſaponem conſtituere neceſſum habet. Quod ſi vero in unico ſolum harum ſingularium commemoratarum proprietatum peccet, tunc ſtatim ſignum penitus infallibile eſt Sal Alkali-fixum non purum fuiſſe.

What Subjects are required to produce fixed Alkaline Salts.

Quantum mihi innotuit, natura cum integro ſuo penu, nullum nobis ſatis purum ſeparatum, & cum recenſitis proprietatibus dotatum, Sal Alcali fixum porrigit, ſed exiſtit, ſi demonſtrabile aliquod reperitur, (qualecunque in toto orbe Sal Alcali nativum invenire & explicare poſſum) unice & ſolum in illo, cum ſale Acido jam permixto, communi vel marino ſale. Circa hoc vero conſiderari oportet, quod Sal Alcali fixum ejuſmodi, 1. Quia illud nunquam nulloque modo in ſtatu ſuo pure Alcalino, ſed ubique, ſive cum acido ſalis communis, vel etiam, quemadmodum in fontibus nonnullis ſotericis, cum Acido Vitriolico conſpurcatum reperitur; ſi denique illud demonſtrare cupio, (poſito me hoc demonſtraturum) variis nihilominus artificiis ab admixtis ejuſmodi rebus liberari prius debet; ita ut talia, artificioſis laboribus educta corpora, (certo reſpectu) haud ſimpliciter pro pure nativis, circa quae ars minime verſatur, declarare poſſim. 2. Quod hocce in Sale communi reperiundum Alcalinum ens, cum denique illud artificiis variis ſeparaverim, & demonſtraverim, nihilominus cum antea recenſitis ſedecim proprietatibus perfecte haud congruens purum, ſed à ſale Alcali-fixo vegetabili ordinario valde diſcrepans Alcali exiſtat. Ex quibus generaliter denique concludo, purum Sal Alcali-fixum naturam minime nobis porrigere, conſequenter omnia Salia Alcalina pura tota ARTIS PRODUCTA eſſe.

Regnum Vegetabilium, vel hiſce adnumeratas res naturales, ſi non in totum, maximam tamen partem, pro ſubjecto & materia agnoſcunt, ex quibus in maxima copia produci & elaborari queunt; Nam licet hinc inde parum quicquam demonſtrativi, in Regno etiam Animali exhiberi quandoque poſſit, attamen, excepto illo, in urina & faecibus à dicto ſale communi dependente, in tam parva quantitate exiſtit, ut attentionem haud mereatur. Rationem, quare tam parum, vel

nihil

nihil Alcalino-fixi exhibeat, ſuo loco, pro viribus, paucis ſubjungam.

Mirum interea videtur & paradoxum, quando de origine & exiſtentia Salis Alcali dicimus produci illud ex re quadam, quae nec granum Salis Alcalino-fixi continuit ; quemadmodum ex omnibus iſtiuſmodi rebus, ex quibus multae librae imo centenarii Salis Alcali fixi eliciuntur, ante operationem in igne, vel ante incinerationem vel combuſtionem, nec granum hujuſmodi, in tentaminibus ſingulis probati Salis Alcalini ad ſenſum educi poteſt ; ſed ſi ſalini aliquid detegitur, ad acidam potius, quam Alcalinam naturam verget.

Praecipuum & maxime neceſſarium inſtrumentum ad productionem Salis Alcalino-fixi eſt IGNIS, utpote in quo praerogativa artis prae natura in tantum conſiſtit, dum hunc pro lubitu & placito excitare, minuere & augere, variaque corpora cum ipſo reſolvere & componere valet, quomodo & quando ipſa cupit : & cum hoc, nempe quod Salia Alcalino-fixa mediante igne producantur, quidam Chymici verbales forte audiverint, hi derepente nudum inſtrumentum pro materia Salis Alcalini, vel pro principio conſtitutivo ipſo venditarunt, & univerſam Salis Alcalino-fixi formationem particulis ignis adſcripſerunt, cum tamen quotidiana experientia plane diverſum, & quod ignis undique tantum ut inſtrumentum ad ejus formationem cooperetur, viſibiliter convincat & demonſtrat, prout & ipſe inſequentibus de hac re ulterius mentem meam ſum explicaturus.

Subjectum, ex quo Sal Alcali fixum produci debet, proprie duo neceſſaria requiſita vel ingredientia contineat, neceſſe habet, quae ad conſtitutionem hujus ſalis abſolute requirantur, nimirum ut, 1. In ſe ſit inflammabile, & oleoſis vel bituminoſis partibus, & 2. Salę quoque acido dotatum. Quod ſi ergo has abſolute & neceſſario requiſitas proprietates in uno ſubjecto conjunctas reperio, tum ſatis quoque ſufficiens eſt, ut Sal Alcali-fixum largiri queat, unde omnia fere vegetabilia, vel eorum partes incorruptae, aptiſſima exiſtunt ; uno vero utrorumque deficiente, parum quoque vel nihil Salis Alkali fixi inde emerget. Hoc ergo fundamento omnis Salis Alkalino-fixi in mundo productio innititur, & pro diverſitate proportionis horum memoratorum duorum neceſſariorum ingredientium, etiam ex hoc vel illo ſubjecto modo plus, modo minus, modo debilius, modo fortius, vel alio modo diverſum Sal Alcalino-fixum acquiritur. Sola ſiquidem oleoſi ingredientis copia omne punctum non abſolvit, dum & imprimis ſal acidum ut adſit, neceſſe eſt. Quod ſi ergo Sal Alcalino-fixum producturus, de quodam vegetabili, ſive ſit herba, radix, lignum, cortex, vel quicquid ejus ſit, antea tantum per alios labores, per quos ſolummodo contentam in eo olei & ſalis acidi proportionem concludere poſſum, ſufficienter inſtructus ſum, tum in anteceſſum quoque judicare potero, an multum vel parum Salis Alcali-fixi daturum ſit : Quod ſi enim parum vel nihil olei poſſidet, parvam quoque Salis Alcali proportionem ſubminiſtrabit, & ſi parum vel nihil ſalis

acidi contineat, vel acidum volatilius exiſtat, multo minus adhuc ſuppeditabit ; unde poſterior haec circumſtantia, plerumque in cauſa & culpa eſt, quod non raro ex magno cujuſdam ligni acervo, vel aliis vegetabilium partibus, parum ſalis Alcali erui poſſit ; & ſicut indubitatum exiſtit, quod omne ſanum vegetabile partes inflammabiles contineat, ita contra multa ex iis, vel parum ſalis, vel etiam volatile & ſub incineratione plerumque diffugiens, ſal acidum continent. Dari quoque poſſunt plantae, ligna, radices & ſimilia, ſalis & olei ditiſſima, quae vero, dum incinerari debent, propter nimiam aëris intercluſionem, tantummodo vaporant, & in carbones, non vero in cineres exuruntur ; qua circumſtantia omne fere ſal acidum, quamvis ejus non parvam quantitatem contineant, praecipue ſi vegetabile adhuc viride, & inſufficienter exſiccatum ſit) ſenſim ſenſimque exhalat, perparum reſtat, & omne quod remanet, cinerem in pauca, & Sal Alcali-fixum in longe minori adhuc quantitate ſuppeditat. Res haec demonſtrari poteſt, *ex. gr.* in Pinu, vel quovis ligno, quo communiter ad urendum utimur : Si ejus aliquot centenarii recipiantur, iique leniter aperto aëre comburantur, ſufficientem cinerem, & ex his notabilem quoque ſalis partem nanciſcemur : Si vero ejuſdem ligni totidem centenarii in parvos acervos conſtruantur, carbonariorum more, vel alio quoque modo, ligno apertus aër adimatur, ejuſque modo tantum ei permittatur, ut vaporare poſſit, breviter carbones conſueti exinde conficiuntur & quidem ea ratione, ne ulli carbones inflammantes, qui in igne aperto aëre, fumantem flammam edunt, reſtent ; ejus modi puros carbones, ſi tum aperto aëre incineres, eoſque in comparatione quantitatis priorum cinerum ponderes, demum Sal Alcali exinde modo conſueto, elixiviando ſepares, & itidem ponderes, haec poſterior methodus immenſum quanto minus cinerum & ſalis in reſpectu prioris, quod ab initio ſtatim aëre aperto incineratum fuit, ſuppeditabit. Nulla alia ex ratione, haec ponderis diverſitas ex ejuſdem quantitatis ligno oritur, quam quod in confectione carbonum pleraque pars ſalis acidi, vel communiter ita appellati ſpiritus lignorum, in aërem aufugerit, quae tamen neceſſariò ad conſtitutionem Salis Alcalino-fixi, tanquam primarium ingrediens, requiritur.

Conſideratu dignum eſt, quod pro acquiſitione cineris vegetabilis abſolute admiſſio aperti vel liberi aëris requiratur, quippe ſine quo nulla ratione cineres acquirantur, unde carbones, occluſo aëre, etiam fortiſſimo & per aliquot annos conſtanter durante igne, ſemper carbones permanent, & nunquam in cineres rediguntur. Nec minus notatu & obſervatu dignum eſt, quod inter carbones & ex eodem ligno confectos cineres, tanta occurrat differentia. 1. Sic ex carbone, quantacunque etiam aquae copia, ne hilum quidem ſalis Alcalini elixiviari vel ſeparari poteſt. 2. Nullum ne quidem fortiſſimum & potentiſſimum acidum ullum effectum in carbone exerit. 3. Nullus carbo cum vitro ſeſe miſcet, quae ſingula tamen cineres praeſtant.

Sed

Sed ut ad formationem Salis Alcalini, ſeu neceſſaria ad id conſtituentia revertamur, veritas & probatio meae Theſeos ex pluribus adhuc momentis & circumſtantiis ulterius ſatis patet. 1. Recipiatur ejuſmodi putridum, carioſum & quaſi emortuum lignum, quod alias dum in decenti vigore adhuc exiſtit, largam ſatis lixivioſi ſalis quantitatem edere ſolet; comburatur, elixivietur, & procedatur in omnibus eadem ratione, ac ſi ſanum lignum fuiſſet, & tunc tandem reſpiciatur, & computus ducatur, quam parum vel nihil Salis Alcali-fixi exinde proveniet. Ratio eſt manifeſta, quia neceſſario ad ejus formationem requiſitae, tam oleoſae, quam praeprimis quoque acidae ſalinae partes antea in aërem exhalarunt & evanuerunt. 2. Aſſumatur planta recens, quae manifeſto ſufficiente ſalis acidi quantitate à natura dotata eſt, ſeparetur exinde ſal acidum, ſeu ita dictum ſal eſſentiale, quo facto herba exſiccetur, (ſeparato nimirum ante dicto ſale acido) comburatur & elixivietur cum omni cautela, tunc ad oculum patebit, quam parum vel nihil Salis Alcalino-fixi ſuppeditatura ſit.

3. Eadem autem herba, eademque quantitate aſſumpta, abſque tamen ſalis acidi vel eſſentialis ſeparatione, tantum ſiccata, combuſta, & modo conſueto ita elixiviata, viſibiliter & aperte per auctiorem Salis Alcali-fixi quantitatem, in comparatione prioris operationis, veritatem demonſtrabit. 4. Vel accipiatur ante extractum ſal eſſentiale acidum, calcinetur debita cum cautione, tum eadem certitudo emerget, & ex eo quoque, quia ejuſmodi ſalia eſſentialia non pure ſalia acida, ſed etiam aperte oleoſis & ad formationem Alcali altera ex parte neceſſariis partibus dotata ſunt, verum ſal Alcali fixum apparatur. 5. Quod ſi porro eadem recentis ejuſmodi herbae quantitas, quae ordinario bonam ſatis Salis Alcalini portionem dare ſolet, aſſumatur, factaque ponderatione tota quantitas in duas partes accurate dividatur, ejuſque pars dimidia ſiccetur, comburatur, & modo conſueto Sal Alcali-fixum porro exinde elixivietur, ponderetur & conſervetur; altera vero pars dimidia ad putrefaciendum reponatur, & decenter tractetur, quo penitus penituſque putreſcat, tum deſtilletur, ita acquiremus, prout non incognitum eſt, ſpiritum urinoſum, ſal volatile & oleum empyreumaticum; ſed reſpiciatur poſtea, quantum Sal Alkali-fixi ex reſiduo jam extrahi poſſit, ſi quidem certo, licet ſumma cum cautione elixivietur, perparum & ſaepe plane nihil emerget; ratio iterum non obſcura eſt, quia requiſita ad fixum Sal Alkali, ſal acidum & oleum, durante putrefactione metamorphoſin paſſa, & partim in ſal volatile, vel ſpiritum urinoſum converſa, partim etiam, & quidem pleraque ex parte, in oleum in ſubſtantia & forma olei per deſtillationem inde ſeparata fuerunt. 6. Quod ſi ad manus ſit purus citri ſuccus, qui aperte ſal acidum, aut paucas vero oleoſas, vel de principio inflammabili participantes partes ſimul continet, ejuſque magna ſatis portio, ad 20, 30, vel plures congios aſſumatur, aquoſum evaporetur, inſpiſſetur, comburatur & elixivietur, tum exinde quoque formatio Salis Alcali-fixi manifeſta reddetur. 7. Quam

optime autem ſenſibus noſtris haec patebunt in tartaro, vel ejus cryſtallis quoque, quippe qui, prout unicuique notum eſt, nihil aliud, quam ſal acidum permultis oleoſis partibus imbutum, continet; quod ſi ergo haec duo hic conjuncta requiſita primaria, nempe ſal acidum & oleum, mediante neceſſario ad hoc inſtrumento, ignis ſcilicet, uſtulentur & comburantur, tum ex reſiduo nullum amplius apertum ſal acidum, è contra vero de novo utique productum Sal Alcali, & quidem copioſe acquiritur; & ſic cum omnibus ſubjectis demonſtrari poteſt.

Quod vero oleoſa quoque ſubſtantia non parum de ſuo contribuat, inter alias diverſas demonſtrationes, etiam ex unica hac cuique facile in ſenſus cadente circumſtantia colligi poteſt; quod ſi *ex. gr.* quatuor librae ſiccati abſinthii incinerentur, & ex lixivio Sal fixum colligatur, accipimus praeter propter ℥ij ſ℈ Salis Alcali-fixi. Jam vero recipiantur itidem 4 librae ejuſdem abſinthii, contundantur, & conſcindantur eae, & pars ipſius oleoſa bituminoſa, ſeu reſinoſa, per ſpiritum vini rectificatiſſimum, quamdiu ſcilicet ſpiritus tingitur, extrahatur; tum plurimum quidem, non tamen omne & univerſum in eo contentum inflammabile educes, omne tamen ſalinum in ipſo interim remanet; quod reſtat poſtea, exſiccetur, comburatur, ſal exinde elixivietur & ponderetur, tum loco ante dictarum 2 ½ unciarum jam unica tantummodo ſalis uncia prodibit; ex quo ergo iterum apertiſſime neceſſarium, ſub priori combuſtione relictum, & ad majorem Salis Alcalini fixi portionem contribuens, in poſteriori vero antiproba, mediante extractione ſpirituoſa ſejunctum, & jam proinde abſens, ingrediens bituminoſum ſeu oleoſum demonſtratur. Pro ulteriori demonſtratione, haec jam memorata, ab extractione ſpirituoſa reſidua, remanentia per aquam excoquatur, herba tum reſtans exſiccetur, comburatur, elixivietur, ejuſque ſal colligatur, tum ejus tantummodo 19, vel 20 grana acquirentur; ratio eſt, quia ex his 4 herbae libris jam omne fere oleoſum & ſal acidum, quae ad compoſitionem & formationem Salis Alcalino-fixi requiruntur, extractum fuit.

How Alkaline Salts are produced, and of what they conſiſt.

Cum ergo clare ſatis pateat, quod ad formationem Salis Alcalino-fixi acidum & principium quoddam inflammabile abſolute requirantur, prout comprobavi, pro primo facile exinde quoque colligi poteſt, quod aliquid ex his 2 tam neceſſariis ingredientibus ſimul in eo reſtare debeat, prout & revera reſtat. Ignis, qua inſtrumentum, quod ad confectionem Salis Alcali adhibendum eſt, nihil aliud peragit, quam quod, 1. Omnem ſuperfluam aquam, 2. Omne itidem ſuperfluum ſal acidum in forma ſpiritus, 3. Volatile demum & ſuperfluum oleum ſeparet. Quemadmodum igitur omnia ſalia, ſive acida, ſive alcalina ſint, ſeu quoquo modo appellentur, nec minus omnia inflammabilia *terram pro baſi vel fundamento* agnoſcunt, quae terra imprimis oculis ſeſe ſiſtit, ſi ejuſmodi mixta magis magiſque à connexis cum ea volatilibus partibus liberantur, & contra ad magis magiſque fixum ſtatum reducuntur: ita hoc quoque hic in generatione vel compoſitione

positione Salis Alcalino fixi videre licet ; dum enim ignis sensim sensimque aliquid de volatiliori inflammabili & sale acido cum aqua propulit, uno eodemque tempore, residuum magis fixum tam sal acidum, quam bituminosum magis magisque concentratur, quando sensim sensimque necessaria ad constitutionem salis acidi aqua perit, quae mediante calore ignis, ex sale acido liberatur, & exhalare cogitur ; eodem, inquam, tempore separatur, altera ex parte, terra, quae in sale acido fuit ; quo diutius ignis continuatur, vel subjectum incineratur, eo plus aquae subtilis, subtilis acidi & inflammabilis abigitur, & tanto plus altera ex parte terrae acquiritur, vel tanto facilius degenerat sal acidum cum pauca phlogisti portione, in terram : Unde *maximum volumen salis fixi ex pura terra consistit :* verum quia haec terra originem suam ex sale acido educit, &, ut ita loquar, naturae acidae est, impossibile est, quod etiam sub prima incineratione vel calcinatione omne sal acidum ex ipsa liberari possit ; sed ultimum potius maxime concentratum &, in comparatione prioris multo volatilioris, jam maxime fixum, ut & magis fixum substantiae inflammabilis in quavis particula hujus terrae impactum restat & inhaeret. Salinum hoc causa existit, quare omnis haec terra dispositionem *solubilitatis* cum aqua retinet, & paucum illud, quod ex inflammabili ortum deducit, causa hic quoque est *causticitatis*, secundum proportionem & modum immixtionis sui.

Ex eodem quoque fundamento, quia scilicet haec terra acidae naturae & familiae est, prodit quoque constans quasi desiderium, sal acidum rursus assumendi, quod ipsorum *affinitas & intima commixtio cum omnibus acidis*, quin imo nuperrime à me demonstratus magnetismus, quo Salia Alcalino-fixa acidum quoque ex aëre attrahunt, tanto magis confirmat. Hoc quoque concentratum & restans paucum sal acidum, ut & haec ad salinam mixtionem prona & jam ab omni aqua liberata terra, aperte unica existit causa, quod haec mixta id rursus quasi concupiscant, quod per calorem ignis amiserant, nempe aquam : inde oritur celeris illa & subitanea extractio humiditatis & *solutio per deliquium*, quin & *incalescentia* illa, quod si fortiter combusta fuere, & tum prima vice humiditatem sentiunt quin etiam ipsa *incensio*, si minerale quid simul adhibitum fuit, quale quid in *sale Tartari causticо cum Regulo Antimonii Martiali* praeparato, ut & *pyrophyris* videre licet. Quod si vero Salibus Alcalicis paucum hoc sal acidum & inflammabile plane adimitur, tum *nuda* tantum restat *terra*, quae nec in aqua amplius solvi potest, nec humiditatem nec acidum ex aëre attrahit, nec incalescentiam producit, & in omnibus quasi emortua apparet ; quamquam Chymicus, dummodo ipsi lubeat, eam rursus, revivificare, & ad dispositionem solutionis & mixtionis cum aqua, imo ad pleraſque priores qualitates reducere valet.

Omne quicquid de formatione Salis Alcalino-fixi superius attuli, unico exemplo aliquatenus jam supra memorato plenarie demonstrare possum, vel quivis illud in propriam sui convictionem imitari poterit.

Recipiatur ſal eſſentiale Acetoſellae, quod viſu, guſtu, tactu, vel quoquo modo ante examinatum, [quamvis nemo quoque iſtud negaturus ſit] apertum ſal acidum, non tamen purum, ſed particulis oleoſis mixtum, ſiſtit. Quod ſi ergo hujus, *e. g.* uncia 1 aſſumatur, ea cum aqua uniatur, tota ſeſe penitus in aqua ſolvit, prout etiam ex ſolutione aquoſa in cryſtallos antea concrevit, & ne minimum quidem indiſſolutum vel cum aqua permixtum reſtat, ita ut nec oleum, nec terra, nec Sal Alcali, nec aliud quicquam peregrinum, ſed nihil aliud, quam purâ ſalis acidi ſolutio videri poſſit. Jam recipiatur porro ℥i. ejuſdem ſicci tamen & cryſtallini ſalis, imponatur ea vaſculo retorto vitreo, & debita cum cautela, igne per gradus adhibito, deſtilletur, tunc ſenſim ſenſimque omne iſtud, quod antea in ſuo ordine circa confectionem Salis Alcali recenſui, jam hinc mediante ignis inſtrumento, quod nihil aliud quam vaſculi retorti & contenti in eo ſalis incaleſcentiam cauſatur, eveniet & producetur. 1. In vas recipiens ſuperflua, quae tamen in ſicco ſale antea latitarunt, aqua & oleum cum ſubtiliſſimo & volatiliſſimo ſale acido prodibunt. 2. E contra non parum terrae inde rurſus ſeparabitur, & reſiduum, cui aliquid ſalis concentrati & olei quaſi fixioris ſeſe innexuit, in perfectum Sal Alcali-fixum degenerabit. Invenientur circiter 3 drachmae aquae pauco ſale acido volatili imbutae, qui liquor alias, ſpiritus acidus Acetoſellae vocari poteſt, ſcrupulum forte unum olei empyreumatici ponderabis, & in vaſculo retorto, ita dictum reſtans caput mortuum conficiet circiter ℥iv & 20 & aliquot grana, ex quo plus quam ℥iii veri ſicci Salis Alcali fixi elicies ; ita ut pauca tantum grana exhalarint & diſperſa ſint, quae de tota uncia, ſi ex omnibus computum traxeris, forte deficiant. Hic ergo omnia prodeunt & eveniunt, quae dixi ; verum praeter Sal Alcali &, quae primo abiit, aquam & ſubtile acidum, oleum quoque adeſt, ut terra plane emortua, quae duo poſteriora jam nullo modo cum aqua miſceri amplius volunt, quamvis antea, cum adhuc totum ſal acidum oleoſum conſtitueret, omnia in eodem ſolverentur. Poteſt quoque Sal Alcalino-fixum deſtrui, parva illa acidi & inflammabilis portio ipſi adimi, indeque quantitas terrae augeri, & ſic unico hoc experimento omnium harum rerum certitudo erui.

Conſiſtit itaque Sal Alkali fixum ex terra quadam ſolubili, in quam, mediante igne, aliquid de fixiſſimo ſale acido ſeſe inſinuavit, ſimul quoque aliquid de magis fixo, vel ad terreſtreitatem magis inclinante bituminoſo, ſeu inflammabili principio, uſtulando quaſi innexum eſt, ita ut novum mixtum ſalinum, quod Chymici *Sal Alcali-fixum* vocant, conſtituat. D. *Homberg*, hac in re, quamvis revera vir egregie habilis fuerit, tamen errorem paſſus eſt, dum ſal acidum tantum cognovit, quod ſeſe terreſtribus particulis innecteret, & ſic Sal Alcali-fixum conſtitueret, de inflammabili vero nullam mentionem injecit. Senior D. *Geoffroi* & D. *Lemery*, in tantum quidem ſub ſuis laboribus obſervarunt, quod aliud quippam adhuc praeter ſupra dictum

dictum ſal acidum & terram, nempe aliquid de principio inflammabili ad conſtitutionem Salis Alcali neceſſario requiratur ; ſed boni iſti viri rurſus in eo defecerunt, dum hoc inſtrumento, ſeu igni, aſſignare voluerunt, cum tamen in iſto ad Sal Alcali fixum adhibito ſubjecto vegetabili, reale ac ſubſtantiale ingrediens oleoſum vel bituminoſum uniuſcujuſque oculis obverſetur. Porrigatur quaeſo his ejuſmodi ſubjectum in manus, in quo antea nullae actuales partes inflammabiles demonſtrari vel conjecturari poſſunt, ſed in quo tantum ſal acidum & partes terreſtres probari queunt ; hoc ſubjectum ipſi poterunt in vaſe retorto, per 20 & plures annos, cum multis centenariis extrorſum vaſi retorto adhibitis, particularum ignis & materiarum luminis [*Parties de feu & matieres de la lumiere*] vel qua ratione ipſi volunt tractare, ea tamen cum expreſſa praecautione, ne cineres ipſos harum adhibitarum inſtrumentalium materiarum ignis addant, dum certo certius ſit ipſos ne unicum quidem granum Salis Alcalino-fixi exinde philoſophando educturos, licet etiam totum *Carteſium* ſimul igni conſecrarint : jam vero ſi ex ipſorum opinione ignis ingrediens, vel conſtituens materiale ipſius exiſteret, neceſſum foret, ut abſolute etiam ex ejuſmodi rebus, in quibus in ſe nullae eſſentiales partes inflammabiles praeſto & immixtae eſſent, illud conficere poſſint : Quod ſi in actum deducere non poterunt prout revera non poterunt, ſed ſemper materia in & ex ſe ipſo inflammabilis aſſumenda venit, quare non ipſas actu realiter praeſentes adhibitas, plane certas & demonſtrativas res, tanquam cauſam reſpiciam, vel quare memet huic & illi philoſopho vel Chymico cerebrino, qui forte per totam ſuam vitam nullum carbonem manibus tractavit, & chymica ſubjecta & hiſtorias non ex ipſorum intima qualitate, & realiter conſtituentibus materialibus partibus diverſarum in iis contentarum materiarum, ſed tantummodo ab extera, mediante circulo, linea, & microſcopio, vel etiam quae cum iis dimenſurare & perſpicere non poteſt, ſecundum propriam chimericam in cerebro tantummodo propoſitam, & in Chymico laboratorio nunquam comprobatam, nec unquam comprobandam imaginationem probabile judicat, ſubjiciam, ipſiuſque deliramenta adorem?

Quod autem ignitio, vel ignis, qua inſtrumentum tantum, ad productionem Salis Alcali fixi requiratur, inter caetera ex Tartaro quoque patet quippe qui utraque primaria praeſidia poſſidet. Poſſidet, ut notum eſt, partes oleoſo-bituminoſas, continet etiam apertum ſal acidum, & utrumque in abundantia ; quod ſi autem ex hoc Sal Alkali abſque igne artificioſe deberet produci, tum nihil amplius adhibendum foret, quam volumen, vel terra quaedam, in quam parum acidi & inflammabilis ſeſe innecteret, & innidularetur ; proinde pro hoc ſcopo oculos Cancri, vel aliud corpus terreum, quod ad minimum cum nullo alio acido imbutum eſſet, adhibere poſſent. Solve igitur in Tartari ſolutione, tantum ante dicti terrei corporis, quantum ſolvi poteſt, evapora aquam & exſicca, tum equidem ex propria mea hypotheſi, qua dixi, quod ſal acidum & in-

flammabile in terra concentrata abſolvant Sal Alcali fixum ex copioſiore terra & pauciore ſale acido & inflammabili fixiore conſiſtat, poſſibilitatem & mixtum quoddam, quod in pluribus circumſtantiis ut Alcali fixum ſeſe gerit, oculis ſiſtes; verum examinetur ulterius ſecundum omnes à me allatas probationes veri & perfecti Salis Alcalino-fixi, tum mox hic, mox alibi patebit, multa adhuc illi deeſſe, & quomodo totum mixtum, ſolutio tantum oculorum cancrorum in acido Tartari, adeoque ſuperfluum acidum & oleum, breviter ipſe Tartarus crudus adhuc ſimul in illo immerſus & irretitus ſit, per conſequens nullo modo verum & perfectum Sal Alcali fixum conſtituat, nulla alia ex ratione, quam quia nullus ignis adhibitus fuit, non ac ſi ex igne plures adhuc particulae ignis ad hoc neceſſariae eſſent, ſiquidem, prout dixi, hic adhuc ſuperfluae inflammabiles partes in oleo Tartari praeſentes ſunt, ſed propterea quia ſuperfluum oleum & acidum exinde ſeparari debuiſſent, unde etiam in hoc experimento, formatio Salis Alcali ad oculum patet, ſimulac modo plus acidi & Alcali per adhibitum calorem ſenſim ſenſimque expulſum, & operationi per neceſſarium inſtrumentum colophon impoſitus fuit. Induſtrius olim *Kunckelius* jam tum temporis animadvertit, quod ex Tartaro & Calce viva, ſi utraque cum aqua coquendo elixivientur, poſſibilis demonſtratio Salis-Alcalini, abſque adhibita ſicca ignitione demonſtrari poſſit; cum vero cum praecedentibus circiter conveniat, & eadem ratione quaedam partes olei empyreumatici Tartari adhuc aliquatenus reſtent, ſuperfluum exiſtimo iſtud in meae hypotheſeos probationem adducere, prout & alias non paucas adhuc cum variis acidis impraegnatas terras, vel plenarias terrarum ſolutiones, tanquam falſa Salia Alcalino-fixa adducere poſſem, niſi prolixitati parcerem.

Of the moſt uſual fixed Alkaline Salts, and how they are to be obtained.

Satis ſuperque notum eſt, quod ex omnibus vegetabilibus, vel potius eorum cineribus Sal Alcali parari poſſit, nec non quod ex permultis herbis & permultis aliis partibus à non exiguo temporis ſpatio ejuſmodi lixivioſa Salia confecta fuerint, & denique quod eodem modo omnia conficiantur, nihilo minus quaedam adhuc de hac materia, tam in genere de Salibus fixis herbarum, quam etiam in ſpecie de reſiduis adhuc in Chymia uſualibus Salibus Alcalino-fixis, ſeu potius eorum praeparatione, quantum fieri poteſt, brevibus adducam.

Modus procedendi ab aliis in 9, ab aliis vero in 6 puncta diſtribuitur; qui in 9 puncta ipſum diſpertiuntur, appellant operationes vel labores, qui pro hoc ſcopo cum ſubjecto vegetabili perficiuntur, prout ex ordine ſequuntur, deſiccationem, combuſtionem, extractionem, ſeparationem, inſpiſſationem, calcinationem, ſolutionem, filtrationem, & inſpiſſationem. Qui vero 6 puncta tantum requirunt, appellant hos labores, deſiccationem, combuſtionem, extractionem, ſeparationem, inſpiſſationem, & depurationem. Ego ad 4 eas reduco, nimirum *inciner ationem*, *elixiviationem*, *inſpiſſationem & depurationem*, dum ſcilicet unus labor alterum ſemper praeſupponit; quod

qnod ſi enim *de incineratione* loquor, quod nempe vegetabile primo in cineres exuri debeat, tum hoc jam praeſupponit deſiccationem, vel quod antea, ſi non ex toto, ſaltem aliqua ex parte exſiccari debeat. Si de ſecundo puncto *elixiviatione* ſcilicet loquor, vel ipſae anus norunt, quod nullum lixivium abſque aqua vel extractione fieri poſſit; norunt quoque, quod haec *extractio*, ſi lixivium appellari debet, à cineribus ſeparanda ſit, ut proinde elixiviatio extractionem & ſeparationem utique praeſupponat; & ſic etiam ſub operationibus *depurationis*, neceſſariae ad eam calcinationes, ſolutiones, filtrationes & inſpiſſationes intelligendae veniunt.

Totus proceſſus producendi Salia Alcalia fixa ex herbis, ſequentibus abſolvitur momentis, quae breviter percurremus: Recipitur herba ejuſmodi, eaque leniter ſiccatur; partem aliquam ſiccatae herbae de alio igne incende, in ignem ſenſim ſenſimque reliquum herbarum conſtanter projice, ita ut leni tantum carbonum igne, minime vero aperta flamma, exuratur & in cineres redigatur, cui rei non parum favet, ſi hic carbonum ignis circa ultimum in magis magiſque anguſtum ſemper acervum colligatur. Quod ſi tandem penitus exuſtio peracta eſt, refrigeſcat, cinis cribretur, ut reſtantes forte non plane incineratae particulae ſeparentur, cinis aqua frigida plenarie elixivietur, lixivium filtretur, filtratum vel in figulino, vel vitreo vaſe leniter evaporetur, denique ad ſiccitatem inſpiſſetur. Medico uſui ſi adaptari debent, & ſi Medicus externam plane non neceſſariam, imo potius noxiam magis quam utilem, pulchritudinem & candorem reſpicere non vult, tum prima haec inſpiſſatio ſufficere poterit; quod ſi vero depurari, imo ex parte plane cryſtalliſari debent, tum calcinantur parum, & denuo in magna ſatis portione aquae ſolvuntur, filtrantur, rurſuſque leniter evaporantur eouſque, donec in ſuperficie parva cuticula apparere incipiat; tum enim in fundum detruncatae cucurbitae, vel aliud ampli orificii vitrum infundatur, & impoſita leviter charta à cinere vel aliis ſordibus praecaveatur, & in locum temperate calidum reponatur, tum ſenſim ſenſimque magna pars in pulchras & egregias cryſtallos jucundo ſaepe ſpectaculo vertetur, praecipue ſi lixivium, adhuc ante apparitionem cuticulae, ab igne auferatur, & in locum leniſſime calidum ad cryſtalliſandum reponatur, & abſque ulla motitatione ſatis temporis ipſi concedatur. Poſtquam igitur in cryſtallos concrevit, reſtans lixivium ab iis decantetur, pars humiditatis rurſus leni igne exhaletur, rurſus in ante dictum temperatum locum reponatur, ut reſiduum, quantum fieri poteſt, cryſtalliſet, quae tamen cryſtalli plerumque pulchritudine ad priores non accedunt, ſed multo minores, imo plane aliter formatae eſſe ſolent. Quod tum vero ſupereſt liquidum, decantetur, & tandem plenarie inſpiſſetur; cryſtalli autem ſemper pauca aqua deſtillata communi celeriter abluantur, & tum ſuper pura charta bibula ab adhaerente humiditate leniter ſiccentur. Si vero non cryſtallos, ſed tantum depuratum album Sal

Alcali deſideres, ante dicto diuturno labore ſuperſedere, & tantum poſt primam calcinationem, ſolutionem & filtrationem, ad ſiccitatem leniter inſpiſſare, & tum in obturato firmiter vitro ab aëre bene praemunire poteris. Haec igitur eſt generalis methodus, qua ſalia lixivioſa herbarum, florum, ſtipitum, &c. puriſſime & optime praeparari poſſunt, ubi tria adhuc monenda erunt. 1. Simulac una tantum, vel altera levis circumſtantia in ante dicto proceſſu immutatur, ſive ſit in exurendo, in elixiviando, evaporando, calcinando, ſive quicquid ejus rei ſit, quod ſtatim & infallibiliter modo hic modo alibi immutatum ſal acquiſiturus ſis. 2. Quod in ejuſmodi depuratis & cryſtalliſatis Salibus Lixivioſis nulla, quae in ſubjecto antea fuit, ſpecifica virtus & proprietas demonſtrari queat. 3. Quod omnia uſitata & praecipue cryſtalliſata Salia herbarum nunquam pura Salia Alcalino-fixa ſint, vel qua talia ad alios Chymicos labores, in quibus purum Sal Alcali fixum requiritur, adhiberi debeant.

Tachenius & cum eo alii contendunt, herbas recentes plus ſalis largiri quam ſiccatas, *Rivinus* autem id pernegat, & ait, ſe id omni adhibita diligentia obſervaſſe, & de eadem herba probam ſumſiſſe ; ſed nullum diſcrimen in iis potuiſſe reperire. Meo quidem judicio uterque certo modo verum dixit: Nam ſi ejuſmodi vegetabile tractes, quod nullum ſubtile vel volatile ſal acidum continet, tum ex ſiccato idem pondus ſalis ac ex recenti acquires : vel etiam ſi herbam recentem, aperto igne flammae, ſiccatam contra leni tantum candefactionis igne incineres, itidem ſemper idem fere aut ſaltem parum differens pondus, quamvis non ejuſdem indolis, Salis Alcalini emerget, adeoque hac ratione *Rivini* quoque opinio veritati conſona eſt.

Sed ſi ejuſmodi vegetabile ſub manus ſit, quod vel tenerum, ſubtile, vel etiam cum aliis partibus obiter tantum commixtum ſal acidum continet, quod ſub incineratione facillime abſcedit, exhalat, evaporat & aufugit : tum utique recens aut ſaltem non adeo plene exſiccatum multo plus Salis largietur, quam aliud, licet tamen unam vel alterum adhuc enchireſin requirat, & hac ratione *Tachenius* applauſum meretur. Dantur vegetabilia, quae omni licet induſtria & praecautione ſub incineratione adhibita, tamen ſubtile ſuum & ad fabricam Salis Alcalici neceſſarium ſal acidum dimittunt, ita ut ex magna ſatis quantitate perparum tamen Salis Alcalici fixi acquiratur. Quod ſi autem exhalatio ſalis acidi hoc vel alio modo impediatur, tum ad oculum plus Salis Alcalini fixi prodibit, id quod rurſus ea, quae de generatione & formatione horum ſalium dixi, luculenter confirmat. Hoc quo eo magis pateſcat, recipiatur tantum *Lignum Guajacum*, quod ſub deflagratione ſal ſuum acidum perquam facile dimittit, quod ſi ſatis magna ejus quantitas exuratur, incineretur, & ex cineribus omni cum praecautione Sal Alkali colligatur, perquam *exigua* ipſius *quantitas* erit ſecundum proportionem aſſumpti ligni ; cujus rei rationem modo attuli, quia ſcilicet ſubtile acidum, ſub deflagratione & effumatione plurima ex parte diffugit ;

diffugit; quod ſi autem eadem ligni quantitas in minutiſſima fruſtula concidatur, vel plane raſpetur, & hoc cum magna aquae quantitate excoquatur, decoctum coletur, reſiduo ligno recens aqua affundatur, & excoctio eo uſque continuetur, donec aqua non amplius tingatur, decocta omnia confundantur, evaporentur, & in extractum inſpiſſentur, quod leniter exſiccetur, & tum tam hoc quam reſidua ſeorſim ſiccata raſpatura vel fruſtula leniter candefaciendo exurantur & incinerentur, tum elixivientur, & methodo conſueta Sal Alkali ex iis colligatur, mirum quanto *major* ipſius *quantitas* inde proditura ſit, quod & de non paucis aliis valet.

Praeter allata Salia Alcalino-fixa, herbarum, proſtat etiam Alcali quoddam lignorum minime pretioſum, & ad multas operationes non incommodum, hoc, quamvis jam plene elixiviatum, inſpiſſatum & calcinatum Sal Alcali revera exiſtat, tamen communiter tam Latina, quam Germanica, ut & quibuſdam aliis linguis, *cinis* tantum appellatur, *cineres clavellatos* indigito. Quicquid ſit, ſive olim purus non elixatus cinis ſub hoc nomine venditus, indeque denominatio retenta fuerit, ſive alia cauſa fuerit, originem hujus nominis inquirere operae pretium eſſe vix exiſtimo. Interim cineres clavellati unicuique ſatis noti ſunt, & à quibuſdam ſimpliciter *Sal Alcali* appellantur. Praeparantur communiter ex cineribus lignorum duriorum, fagi, aceris, betulae, fraxini, quercus & ſimilium, unde & quomodo parentur, & qua ratione optimi cognoſcuntur, videre licet in *Kunckelii Arte Vitriaria*, *Valentini Muſaeo Muſaeorum*, & in Tractatulo, qui *Ars tinctoria experimentalis & fundamentalis* inſignitur. Hi cineres clavellati prout emuntur & venduntur, *non* conſtituunt plane *purum* & ad omnes labores chymicos aptum *Sal Alcali*, qua propter ii antea adhuc ſemel depurandi ſunt, quod non difficulter fieri poteſt, ſiquidem nihil aliud agendum, quam ut dictis cineribus clavellatis *aqua* & quidem *frigida*, ſed ne nimia copia, affundatur, ſolvantur, ſolutio filtretur, leniter evaporetur & inſpiſſetur, tum eadem ratione & bonitate ac quodvis *puriſſimum Sal Alcali* adhiberi poterit. Id quod à decantata ſolutione cinerum clavellatorum reſtat, & in aqua frigida ſolvi negat, *non* eſt amplius *purum Sal Alcali* fixum, ſed praeter partes alcalinas adhuc etiam de *Sale acido*, & quidem *vitriolico*, participat: nam ſi iſtud aqua fervide calente plene diſſolvatur, filtretur, & ſolutio, poſtquam ex parte evaporata fuit, per aliquot horas reponatur, candidas & egregias cryſtallos reperies, quae in omnibus probis & inquiſitionibus ut verum ſal enixum ſeu medium, quod ex alcali fixo & acido Vitriolico componitur, breviter ut *Tartarus vitriolatus* ſeſe gerant; quod autem ab hac ſecunda cinerum clavellatorum cum aqua fervida tractatione ſolvi recuſat, & in filtro remanet, ſunt inutiles plane foeces & ſordes.

Praeterea extat aliud purum Sal Alcalino-fixum, quod ordinario pro optimo habetur, & hactenus tam ad Chymiam, quam ad Medicinam prae omnibus aliis adhibitum fuit; eſt iſtud *Sal Tar-*

tari; qua ratione id paretur, itidem res eſt ſatis ſuperque nota, qui vero illud tenerius & penetrantius requirit, duplici modo hoc adipiſci poterit, *vel calcinando, ſolvendo, filtrando & inſpiſſando, vel etiam calcinando, per deliquium ſolvendo, filtrando & inſpiſſando*; hi duo purificandi modi, ſi non ſaepiuſcule reiterentur, in pleriſque conveniunt, & tum *differunt tantum in ſolvendo & deliqueſcendo:* quod ſi autem una ex parte *calcinatio*, & altera ex parte *deliqueſcentia* ſaepe ſaepiuſque inſtituatur & reiteretur, tum ingens utique & ſat *notabile diſcrimen* oſtendent. 1. Inſtituta & reiterata ſaepe *calcinatione* ſenſim ſenſimque aliquid de reſtante adhuc inflammabili & ſale acido, imo & de ſubtiliſſima terreſtri parte ipſa deſtruitur, imo totum mixtum Sal Alkali conſtituens quaſi invertitur, & in puram in aqua non amplius diſſolubilem *Terram* commutatur: quod ſi ſupra adductorum Autorum opinio vera exiſteret, & *particulae ignis* ad productionem Salis Alkali, *tanquam materiale ingrediens*, concurrerent, hic plane non ad ejuſmodi deſtructionem, ſed potius ad augmentationem Salis Alkali fixi devenire deberet, dum hac ſaepius repetita calcinatione *recentes* ſemper *particulae ignis* admoventur, tantum abeſt, ut eae deficere poſſint; nihilominus unuſquiſque veritatem dictorum experiri, deque hac repetita calcinatione experientiam conſulere poterit. 2. E contra, inſtituta & repetita *ſaepius ſolutio per deliquium* & inſpiſſatio plane contrarium demonſtrat, dum ejus vice, quod per calcinationem ſubtilius aufugit, & magis terreſtre remanet, hic potius ejuſmodi crudiores terreſtres particulae ex Salibus Alcalibus fixis potius ſeparantur, extricantur, *teneriores* contra *& ſubtiliores* in his per deliquium ſolutis ſalibus retinentur, unde ejuſmodi ſalia, hac ſaepe ſaepiuſque repetita per deliquium ſolutione, eo tandem redigi poſſunt, ut *nec in frigore, nec in calore amplius ſiccam conſiſtentiam recuperent, ſed ſemper conſiſtentiam humidam, fluxilem*, forte ut oleum Vitrioli, *conſervent*, & in igne ejuſmodi ſal tenuiora crucibula potius ſolvat, craſſiora autem citius penetret, quam in forma ſicca apparant.

Non inuſitatum etiam Sal Alcali fixum eſt ita appellatum *Nitrum fixum*, ſeu Nitrum alcaliſatum: Quod licet cuique notum, ejuſque praeparatio tanquam vilis & nauci aeſtimari poſſit, meas tamen quoque circa iſtud negotium cogitationes, forte quibuſdam ſcitu adhuc neceſſarias, jam exponam. *Alkaliſatio Nitri* ſequenti innititur fundamento: ſimulac *Nitrum cum quodam bituminoſa vel craſſe terreſtri inflammabili corpore miſcetur & detonatur*, ſtatim una ex parte Nitri reſolutio, & contra altera ex parte generatio, vel nova compoſitio Salis Alcali oritur, ubi bene inſimul notandum, quod non tantum Sal Alkali fixum, ſed & in eodem momento *adhuc Sal Alcali volatile, vel urinoſum* generetur, ſi, inquam, Nitrum cum terreſtri quodam inflammabili corpore commiſcetur, exempli gratia, bitumine, pice, colophonio, fuligine, tartaro, maſtiche, ſulphure communi, carbonibus, gummi ſandarachae & ſimilibus, tum Alkaliſatio ſtatim procedit, ſimulac cum iis detonatur, vel deflagrat; ſed cum *ſubtilioribus*

ribus mixtis *inflammabilibus*, ut ſpiritu vini rectificatiſſimo, & ipſis oleis deſtillatis, non ita procedit; niſi cum poſterioribus ſingularia artificia adhibeantur. Viliſſimum & proinde etiam uſitatiſſimum additamentum ſunt carbones pulveriſati, ut notum eſt; ne autem hunc tibi conceptum in animo formes, ac ſi Sal Alkali ex adhibitis carbonibus ortum duceret, ſiquidem tota carbonum libra tantum aliquot drachmas cinerum, hi cineres vero tantum aliquot grana Salis Alcali fixi largiuntur, id totum fere a Nitro ipſo dependet, unde quoque pro ulteriori adhuc penſitatione adducam ſequentia momenta. Libra una optime depurati Nitri cryſtallini continet praeter propter partem dimidiam aquae, unam quartam ſalis acidi, & unam quartam additamenti Alcalini, quod ad corporificationem acidi nitroſi, & ad figurationem formae cryſtallinae in conficiendo Nitro additur, unde quoque totum Nitrum ſal medium exiſtit; quod ſi autem huic librae Nitri ℥iii vel iv carbonum admiſceas, quae *per ſe* circiter 3 vel 4 gr. *Salis Alkali* fixi ſuppeditant, & cum hac carbonum quantitate ante dictam Nitri libram alcaliſes, accipies, ℥ viii vel 10 imo, ſi recte operatus fueris, fere ℥ xii purificati & boni Salis Alcalini. Jam ergo oritur quaeſtio: *unde tantum pondus?* ſi quidem vix ℥ iv. additamenti alcalini in tota Nitri libra praeſto ſunt. Quiſque rem hanc ulterius conſideret, & ea, quae de origine Salis Alcali fuſe ſatis dixi, in conſilium trahat; forte tum quaeſtionem hanc ſibi ipſimet facile diſſolvere poterit.

Dixi in genere, Nitrum cum omnibus craſſe terreſtribus inflammabilibus ſubjectis alcaliſari poſſe; ſed ne cogites proinde velim, ac ſi etiam in genere unum, & quoad omnia ſemper idem, Sal Alcali fixum inde proditurum ſit. Minime; ſed prout inter inflammabilia additamenta ipſa, modo hoc, modo illud diſcrimen reperitur, ita ſemper utique aliquo modo diverſum, modo magis vel minus ſubtile, craſſius, modo ſumme cauſticum, vel etiam obtuſius, ſemper tamen Nitrum fixum, quamvis non ubique & omni ex parte plane aequale, ſed modo hic, modo alibi differens Alcali, quod vel a proportione, vel, & quidem ut plurimum, a differente indole & natura additamenti, ut & ſingulari ratione ab iſto magis magiſque fixo, vel in aliis fixis materiis concentrato, imflammabili dependet, ex quo *cauſticitas* quoque primario *ortum* ſuum *deducit*, *e. g.* ſi nitro ejuſmodi ſubjectum admiſceo, in quo inflammabile equidem copioſe, ſed *tantum ſuperficie tenus* praeſto, imo *cum multa aqua* adhuc extenſum, & proinde *magis ad volatilitatem diſpoſitum* eſt, ut *in reſinis*, pice, colophonio, & ſimilibus, tum accipio quidem *nitrum fixum*, ſeu alkaliſatum, ſed longe *non adeo cauſticum*, ac ſi ejuſmodi ſubjectum ipſe addo, in quo *phlogiſton magis fixum & terreſtre* factum eſt, quod iterum *ex gr. per additamentum Reguli Antimonii Martialis* facile demonſtrari poteſt; quippe in quo ſolummodo concentratum principium *inflammabile terreae indolis* ex Marte *cauſticitatis vera cauſa* exiſtit, qua occaſione non diffiteor, memet ipſum, in quantum adhuc *originem cauſticitatis* conſidera-

vi & obſervavi, huc uſque *nullum Sal Alcali fixum abſque additione ſubjecti mineralis cauſticum reddere noſſe* & poſſe, ut propterea haec materia ulteriore adhuc diſquiſitione indigeat; imprimis cum & alia occaſione oſtenderim, qua ratione ex eodem plane fundamento *Sal Alcali volatile cauſticum* produci queat.

Ordinarium *Nitrum cauſticum* fixum ex partibus anaticis Reguli Antimonii Martialis & nitri cryſtalliſati pulveriſatis ante & mixtis caementando paratur, prout notum eſt. Quin & Regulus Antimonii, calx viva, ut & plura alia mineralia tartaro crudo ejuſque ſali, imo etiam ipſis depuratis cineribus clavellatis, methodo ſatis nota *enormem cauſticitatem* inferunt, ita ut ordinarium cum calce viva & depuratis cineribus clavellatis, vel ſale tartari paratum, & ordinario quoque appellatum *Sal alcali cauſticum* omnia corpora tenacia animalium, ut pennas, crines, lanam, oſſa, cornua, ungulos, *&c.* in *mucum.* & pinguedines parvo temporis ſpatio in *ſaponem*, ſulphur autem in *rubrum liquorem* diſſolvat. Quod ſi hoc Sal in forma liquida ſolutum exiſtat, tum appellatur *lixivium ſaponariorum*; ſi adhuc ſemel in crucibulo fundatur, & tum in exiguas oblongas portiones, praeter propter ut partes fiſtulae tabaci ſimiles, effundatur, tum *lapis infernalis alcalicus*, *cauterium potentiale*, & quibuſdam *Sal Chirurgorum* appellatur.

Tandem praeter *duas* has a me allegatas magiſque conſuetas *nitrum* alcaliſandi *methodos*, *adhuc tertia* huc illuc uſitata eſt, nimirum, *ſi nitro*, carbonum, vel reguli loco, *tartarus pulveriſatus addatur.* Quanquam hoc praeparatum, ex uſitata conſuetudine *nunquam nitrum fixum*, ſed poſtquam elixiviatum & inſpiſſatum fuit, potius *ſal Tartari extemporaneum* & ſi non elixiviatum vel depuratum fuerit apud aurifabros, docimaſtas, Metallurgos, monetarum tractatores, zonarios, alioſque circa metalla verſantes artifices, *fluxus niger* appelletur: Verum & hoc nitrum fixum non ita promiſcue pro quovis alio ſumendum erit, ſi quidem itidem *pro diverſa* dictorum duorum ingredientium *proportione*, *etiam diverſa ſalia* emergunt. Quod ſi igitur *fluxum* hunc *nigrum* praeparare volo, recipiuntur 1. vel *partes aequales* utriuſque, vel etiam 2. *nitri pars una & tartari partes duae vel tres:* ante dicti mechanici artifices ſolent utrumque ſeorſim pulveriſare, pulveres utroſque miſcere, tum in purum ferreum mortarium injicere & pruna candente incendere, & plerumque hoc ita crude adhibent, abſque ulla elixatione, filtratione & inſpiſſatione, ſeu depuratione. 3. Quod ſi vero prima ſtatim detonatione album plane ſal deſidero, tum *ad tres vel duas nitri partes tantum unica tartari* recipitur. Circa has tres *diverſas proportiones*, ut ante jam notavi, etiam ſequentes *diverſae circumſtantiae* occurrant. 1. *Si* 2 *partes nitri ad* 1 *tartari partem* aſſumantur, tum *non omne nitrum* plane *alcaliſatum* exiſtit, ſed ex parte adhuc nitrum crudum ei inexiſtit. 2. *Si* 2 *vel* 3 *partes tartari cum* 1 *parte nitri* commiſceantur, tum omne nitrum equidem reſolutum & alcaliſatum eſt, ſed e contra *non omnis oleoſa tartari ſubſtantia conſumpta & exuſta* eſt, ſed magna pars adhuc reſtat, unde quoque idcirco *haec proportio* tantum & unice ad *liquefactiones*

factiones & reductiones metallorum prae aliis proportionibus longe commodior, aptior & *utilior* deprehenditur, interim & hoc (ſi volupe fuerit) inſtituta de novo calcinatione, itidem à ſuperfluis oleoſis partibus liberari, & ſic in *perfectum Sal Alcali redigi* poteſt, quod vero tum Sal Tartari extemporaneum, vel extempore paratum, vocari non poteſt. 3. Proportio media, ubi *partes anaticae* aſſumuntur, optima quidem videtur, interim negari non poteſt & eam *adhuc* quandam *nitri crudi partem* ſecum retinere.

Sub hac modo adducta, & tanto magis *ex* 2 *partibus nitri* compoſita proportione, durante deflagratione, *realis ſeparatio principiorum vel partium conſtituentium tartari oboritur*, ubi 4 *notabiles circumſtantiae & momenta* occurrunt. 1. Maxima pars oleoſitatis tartari non modo reſolvitur, ſed & ita conſumitur, ut vice ejus quod alias in deſtillatione Tartari notabilis *copia olei* in forma fluida ſeparatur & appareret, *hic* ſub detonatione cum nitro *nullum* aliud *ipſius veſtigium*, quam paucum ſiccae fuliginis ob oculos veniat. 2. Altera notabilis circumſtantia ſub hac ſalis Tartari extemporanei formatione haec eſt, quod, cum alias durante deſtillatione vel exuſtione Tartari, ſeparatio olei, ſpiritus & phlegmatis una ex parte, & nova formatio ſalis fixi alcalini altera ex parte, per conſequens *omnia tarde* eveniant, & aliquod temporis ſpatium requirat, *hic omnia ſimul & ſemel unico momento* & unica detonatione procedunt. 3. Notum eſt quod tartarus & nitrum (quodvis ſeorſim) *ſi deſtillentur*, *ſpiritum acidum* ſuppeditent, *hic autem*, ubi haec duo ſalina mixta conjunctim deflagrant, *ne hilum* quidem *acidi* emergit, *ſed* rurſus plane aliud, imo *contrarium*, & de novo formatum, *ſcilicet urinoſum* ſenſibus noſtris ſeſe ſiſtit. 4. Cum in communi exuſtione tartari per ſe uſque additamento, ſemper *non exigua portio terrae indiſſolubilis* poſt perpetratam Salis Alcalici elixiviationem reſtet, hic in Salis Tartari extemporanei praeparatione *fere nihil indiſſolubilis terrae* reperiatur, ſed omne iſtud *in purum ſal*, & quidem *in momento & incomprehenſibili celeritate* convertatur.

2. *De Salibus lixivioſis plantarum* primum *in genere notandum* venit. Quod in quantum forſan una vel altera differentia interea ſeſe exſerit, iſta *plane non à ſpecifica indole & ſingularibus viribus*, quas una vel altera planta *ante combuſtionem & incinerationem poſſedit*, ortum trahat, ſed differentia iſta primario dependeat *à duabus aliis circumſtantiis* ; (prout hoc experientiſſimus Chymicus D. *Stahl* jam animadvertit) nimirum 1. *à diverſa ſtructura* vel teneriorum vel craſſiorum partium plantae ; & 2. *ab operatione*, vel mutatis in ea enchireſibus & parvis manipulationibus. 1. *Ratione ſtructurae* aquirirur, *e. g.* longe aliud Sal Alkali ex ſubtilibus & teneris foliis, quam ex craſſioribus caulibus ejuſdem herbae ; aliud è petalis florum, vel toris floribus, quam è lignis ; aliud è ſeminibus, quam è radicibus ; aliud è ſucco expreſſo quam extracto, quod è ſiccata herba cum multa aqua & forti coctione paratum erat ; aliud ex teneris recentibus herbis, quam è valde exſiccatis ; & ſic porro.

Continued by the ſame. N° 393. *p.* 45.

Whether fixed Alkaline Salts differ one from another, and how.

porro. 2. *Ratione operationis*, acquiritur longe aliud Sal Alkali è leni tantum fumante excandeſcentia & incineratione, quam è forti flammante combuſtione; aliud ab elixiviatione cum aqua frigida, quam cum aqua calida, imo cum reali excoctione ebullitoria; aliud ſi parum aquae, quam ſi multum adhibeas; aliud ſi parum & ſemel tantum calcines, quam ſi fortiter & ſaepius calcinatio reiteretur; aliud ſi Sal inſpiſſatum cum multa aqua iterum ſolvas, quam ſi per ſe in deliquium fluere permittas; idque rurſus ſecundum plures etiam alias circumſtantias. Sed, *niſi* Salia lixivioſa de *induſtria*, *forte per repetitas calcinationes*, *vel deliqueſcentias*, ad nimiam & maxime notabilem differentiam redigantur, in communibus ordinario uſitatis laboribus & praeparationibus *horum ſalium* reperibilis *differentia parvae vel nullius eſt conſiderationis*, excepto *ſi forte minerale* quippiam, *vel de induſtria*, *vel incuria*, *vel inſcitia adhibitum fuit*. Quod ſi ergo apud ordinaria pure praeparata ſalia lixivioſa herbarum, diverſitas quaedam tamen reperiretur, in hoc tantummodo conſiſteret, quod unum magis pure alcalinum quam aliud, unum ſubtilius, aliud craſſius, unum magis terreſtre quam aliud, unum paulo magis cauſticum quam aliud, unum cum pluribus ab oleoſo ingrediente oriundis partibus, vel etiam copioſiore ſpiritu acido imbutum, indeque magis cryſtallinum ſit, quam alia ſalia: de cetero *ſingula ſunt ſalia lixivioſa*, *ſingula ſalia fixa & alcalina*, *ſed ſingula non ſunt vere pura*, *cum puriſſima ex iis adhuc ſint impura*, *& ad alias chymicas applicationes adhuc inepta ſalia alcalina*, dum pleraque apertum quippiam & ſuperfluum acidum, quaedam etiam ſuperfluam terram aliaſque accidentales peregrinas immixtiones, ſi non voluntarias ineptas additiones, tanquam putatitia artificia pro acquirendis ſpecioſis cryſtallis, ſecum foveat: Ita ut, ſi *ordinaria in Pharmacopoliis parata vegetabilium cryſtallina lixivioſa Salia*, animo revolvo, ſaepe non ſatis mirari poſſim, quare iſtiuſmodi ſalia in hodierna praxi medica adhuc toto die adhibeantur, cum tamen medico ignotum ſit, quale ſal aegrotis commendet, *quia ejuſmodi cryſtalliſata ſalia nec pura alcalina*, *nec perfectè ſaturata ſalia neutra exiſtunt*, *& per conſequens accurate novit nemo*, *quantum alcali*, *& quantum acidi una drachma vel uncia talis pulchre cryſtallinini ſalis contineat*, item, *an praeſens ibi & ad cryſtalliſationem diſponens acidum*, *vegetabile*, *vel minerale acidum ſit*. Quod ſi egomet in praxi medica *Sale Alcalino fixo* opus haberem, tum purum *Sal Tartari* vel etiam depuratos *cineres clavellatos* reciperem; quod *ſi ſal acidum* ex uſu foret, tum ex apertis *puris acidis* commodiſſimum ſeligerem, & *ſi ſal medium* adhibendum eſſet, itidem ejuſmodi *ex uſitatis plene ſaturatis ſalibus mediis*, quae me certiorem reddunt, & quod ad praeſentem aegritudinem pro commodiſſimo reputarem, in uſum vocarem; tum enim certo ſcirem, quid ex Pharmacopolio daretur, & quid aegroti ſumerent, reliqua autem *incerta* & imperfecte ſaturata *ſalia*, *quae nec pura ſalia acida*, *nec alcalina*, *nec media ſeu neutra ſunt*, *ſecure negligerem* & ſuo loco relinquerem.

Iſtam adhuc admonitionem dare volo, quod ſi forte adhuc unum vel alterum ſingularem effectum ab hoc vel illo ſale vegetabili lixivioſo expectare velis, & quod ſi poſſibile eſt, ut quoddam Sal Alcalino-fixum adhuc ſingulare quippiam in re medica prae alio poſſidere queat, ut ejuſmodi herbam ad minimum quam *leniſſime excandeſcere* ſinas, *non violenter incineres*, *multo minus fortiter exuras*, omnium minime vero *nec cineres nec ſal calcines*, tum forte ſpecifica quae expectatur virtus, *in paucis* quibuſdam reſtantibus revera *oleoſis partibus* (quippe in quibus tantummodo ſitam eam eſſe oportet) aliquo modo conſervaretur; cum contra certior ſim, quod *ſi* abſque conſideratione & cautione *igne flammae exuratur*, *calcinetur & depuretur*, quod inquam revera *nihil ſpecifici* nec ſingularis amplius *reperiri aut demonſtrari* queat. Quanquam igitur curioſitatis gratia, *ex una eademque planta*, *abſque ullo peregrino additamento*, unice *mediante igne & aqua*, ut non dicam 40 vel 50, dicam tantummodo permulta genera ſalium alcalinorum fixorum, quorum aliud ab alio ſemper aliqua in parte, licet parum tamen aliqua in re, modo externo aſpectu, modo etiam interna leviore circumſtantia differre debet, praeparare & producere norim; tamen altera quoque ex parte non ignotum mihi eſt, quod non tantum haec multiplicia ex una eademque planta artificioſe producta, ſed & *omnia lixivioſa herbarum ſalia*, imo quod plus eſt, *omnia ſalia alcalino-fixa in orbe reperibilia ad eundem aſpectum*, *virtutem & efficaciam reduci poſſint:* ita ut hoc reſpectu & intellectu non niſi unicum & unius generis Sal Alcali fixum ex omnibus vegetabilibus in orbe ſtatuam, dum vel hoc unicum in varias formas & effectus, vel etiam omnia alia ad eundem aſpectum & effectum reducere poſſum, adeo ut *ſi ſalia lixivioſa ex centum vel pluribus herbis parata* ante oculos haberem, *ullum ſal*, *multo minus ullum ſubjectum* ex quo ejuſmodi Sal Alkali productum fuerit, *divinare poſſit nemo.* Quin nemo potis eſt tantummodo in genere cognoſcere, num ex eſculento aut innocuo, vel è ſumme venenoſo & maxime nocivo vegetabili confectum ſit; an ſubjectum ſuaveolens, vel graveolens, plane abſque ullo odore vel foetore fuerit; an ſapidum vel inſipidum; purgans vel adſtringens; antiſcorbuticum, epilepticum, vel antefebrile, emeticum, vel diureticum, narcoticum, vel ſternutatorium, cauſticum, vel balſamicum; an ligna, vel radices, cortex, vel medulla, flores, vel herbae ſemina, vel ſucci, vel quicquid fuerint, ex quibus ejuſmodi praeſens ſal alcalinum paratum ſit. Exiſtimo haec ſufficere poſſe pro iis, qui adhuc conſtanter opinantur, *Salia Alcalina fixa ſpecificam* herbarum aliorumque vegetabilium, ex quibus producuntur, *virtutem ſecum retinere*, ita ut ſal caryophyllorum & cinnamomi ſtomachicum, ſal hyoſyami & papaveris narcoticum, ſal radicum jalappae purgans, ſal radicum tormentillae, vel corticum chinae chinae adſtringens vel antifebrile, ſal ipecacuanhae & gratiolae emeticum, ſal eſulae cauſticum & ſal cicutae venenoſum & lethiferum eſſet, convincendis, quin & ad univerſos reſurrectionis fratres ita confundendos, ut reſuſci-

tationem & revivificationem vegetabilium non ita facile concipere debeant, dum demonſtrari ipſis poteſt, omnia ejuſmodi ſalia lixiviosa in toto Regno Vegetabili ad eandem figuram & effectum, imo (ut ante dixi) ex eadem herba ad tam multiplicia ſalia reduci poſſe: unde aperte hic profiteor, *nemini hominum poſſibile eſſe, ex cineribus, vel lixivio ne quidem ſolam externam figuram iſtius vegetabilis, ex quo parata ſunt, rurſus producere, vel in ſale ipſo ex ejuſmodi puris ſalibus repraeſentare*; de induſtria dico *ex ejuſmodi puris ſalibus*; ſiquidem ipſe non una vice vidi, ejuſmodi figuras herbarum *ex teneris aeneis, & ſubtilibus linteis filis* praeter propter *artificioſe concinnatis*, & in lixiviis concentratis impoſitas vel ſuſpenſas fuiſſe, ubi utique omnia ad ejuſmodi fila circumcirca cryſtalliſata fuere, quae deceptor ignaris *tanquam veram reſuſcitationis plantarum repraeſentationem* commonſtravit: verbo, tota quae praetenditur *humana arte reſuſcitatio, in veritate non fundata, ſed tantum chimerica imaginatio eſt, & non niſi in libris viſibilis.* Reperitur etiam *inter puriora & ad chymicos labores aptiora cognita fixa alcalica ſalia* ipſa, in hac vel illa parte *quaedam differentia quae vero* itidem ab exercitato chymico *omnia removeri*, ea penitus *aequalia & ad eandem figuram & effectum reduci poſſunt.* D. *Hoffmannus* in libro 2. Obſer. Phyſ. Chym. ſelect. ſub N° 29. totum caput hac de re conſignavit, *nihil tamen quam differentias ipſas obſervavit & protulit*, quae praeter propter & ſummatim in his conſiſtunt. 1. Si oleum vitrioli nitro fixo affunditur, tum ſub efferveſcentia verus ſpiritus nitri, vel aqua fortis exhalat. 2. Hoc vero nunquam fit, ſi oleum vitrioli ſali tartari, vel cineribus clavellatis affundatur. 3. Quin & in his utriſque poſterioribus rurſus quaedam obſervatur differentia, dum à ſale tartari (ex affuſione olei vitrioli) ſuperficies nigricantem cuticulam acquirit, liquor ipſe nigricans evadit, & plane alius foetor, quam ſpiritus nitroſi, à nitro fixo deprehenditur. 4. Omnia autem haec à cineribus clavellatis non obſervantur, dum ab iis nec ſpiritus nitri, nec cuticula, nec nigricans color ſeu ſolutio, ſed iterum ſingularis vapor apparet. 5. Fumi hi nitroſi etiam manifeſti fiunt, ſi oleum vitrioli ſali tartari extemporaneo, quod ex 2 partibus nitri & 1 parte tartari paratur, affunditur. 6. Quod vero iterum non licet videre in ejuſmodi ſale tartari extemporaneo, quod cum pauca additione nitri elaboratum fuit. 7. Ex ſale tartari & arena vitrum clarum & pellucidum parari non poteſt. 8. Bene autem ex ſale tartari extemporaneo, ut & ex cineribus clavellatis. 9. Ex ſale tartari, vel cineribus clavellatis in crucibulo fuſis, adjectis carbonibus, reſultat ſpecies hepatis ſulphuris, quale tamen nec nitrum fixum, nec nitrum cauſticum conſtituit. 10. Sal Tartari & Nitrum cauſticum cum Spiritu Vini rectificatiſſimo tincturam largiuntur, quam vero nec nitrum fixum, nec cineres clavellati, nec iſtud ſal tartari extemporaneum, quod ex 2 partibus nitri & 1 parte tartari paratur, depromunt.

Has

Has quidem *differentias Hoffmannus advertit, ſed non adduxit, unde haec eveniant, qua in re differentia haec ſita ſit, an, & quomodo iſta meliorari & corrigi queant, multo minus quomodo haec adeo differentia ab ipſo reperta ſalia Alcalino-fixa penituſque aequalia reddi poſſint*, cum tamen omnia & ſingula naturali ordine procedant, differentia non adeo difficulter percipi & facile corrigi, & unum ſal alteri aequiparari poſſit, adeo ut *primum* ne unicum quidem phaenomenon, ex omnibus ſupra allegatis, uni vel alteri ſali ſingulare exiſtat, & *ſecundo* inter omnia pura fixa alcalica ſalia nullum aliud diſcrimen amplius, niſi circa gradus cauſticitatis adverti debeat. (*a*) Affuſum oleum vitrioli in nullo dictorum ſalium ſingularem, ſed ſemper eundem vaporem & foetorem producere debet. (*b*) Omnia haec ſalia aequaliter in clarum & pellucidum vitrum redigi debent. (*c*) Singula etiam Spiritum Vini rectificatiſſimum pulchro colore tingere debent, & ſic porro. Sic non neceſſum eſt mirari, *quod oleum vitrioli ex nitro fixo*, vel *ex ſale tartari extemporaneo, quod cum 2 partibus nitri* paratum fuit, *ſpiritum nitroſum ejiciat*, dum, ſi hoc apparet, in ejuſmodi ſale Alkali neceſſario *adhuc* quaedam *nitri crudi portio* ineſt, unde exundantes ex eo fumi (qui nihil aliud quam verum ſpiritum nitri conſtituunt) adeo naturales ſunt, ac ſi Glauberiana methodo oleum vitrioli nitro crudo affunditur, cum è contra utique ex *ſale tartari vulgari, ex cineribus clavellatis, aliiſque* ejus generis *alcalinis ſalibus, quibus nitrum non accedit*, imo quibus non ſuperflue accedit, etiam *nullus ſpiritus nitri* liberari, vel fumus nitroſus exſpectari poteſt. Haec res quo tanto certius pateat, recipiatur tantum *idem nitrum fixum, vel idem ſal tartari extemporaneum*, à quo ab affuſione olei vitrioli fumus nitroſus apparet, idque denuo cum uno vel alio ſubjecto inflammabili Regni vegetabilis commiſceatur, *e. g.* nitrum fixum *cum majori* carbonum *quantitate*, & ſal tartari extemporaneum *cum copioſiore tartaro* conjungatur, & deflagret ut ante, vel majoris certitudinis cauſa proportio carbonum, vel tartari adhuc plus augeatur, quo ſuperfluum antea, & adhuc crudum exiſtens nitrum plus inflammabilis terrae reperiat, quacum incendatur & alcaliſetur, *ut* per conſequens *nihil nitri crudi amplius reſtare poſſit*, tum revera ex hoc recollecto ſale, ab affuſione olei vitrioli, *nullus* ſpiritus nitroſus amplius, ſed potius plane alii vapores effumabunt. Quod *oleum vitrioli cum ſale tartari* foetorem ſpiritui nitri plane diſſimilem, nigricantem cuticulam, & obſcuram ſolutionem efficiat, hoc à nulla alia re, niſi à ſuperfluis adhuc *in ſale tartari reſiduis empyreumaticis* partibus unice dependet; quod ſi ſal tartari ab iſtis partibus decenti modo repurgatum eſt, tum itidem nec foetor amplius, nec nigricans ſubſtantia, utpote *quae oleum vitrioli cum omnibus oleoſis contrahit*, apparebunt: unde ex *cineribus clavellatis*, quia iſti, mediante calcinatione, *ab oleo empyreumatico* magis *liberati* ſunt, ut & ex *puro ſale tartari*, ſi ſufficienter calcinatum eſt, ejuſmodi nigredo nunquam apparet, nec demonſtrari poterit, ſed ab affuſione olei vitrioli omnia clara, & albida permanent.

nent. Simili ratione *hoc oleum empyreumaticum in ſale tartari* unica exiſtit cauſa, quare cum arena pellucidum vitrum non largiatur; ſimul ac ſuperflua haec oleoſa ſubſtantia ipſi dempta fuit, tum eodem modo, adeo aptum & commodum eſt ad pellucidum vitrum conficiendum, ac *cineres clavellati, vel ſal tartari extemporaneum* ipſum: hanc rem declarat & confirmat, quod ſub ejus praeparatione, durante detonatione cum nitro, *omnis oleoſa tartari ſubſtantia combuſta & deſtructa* eſt: unde hoc Sal Alkali, quamvis tartarus ad ejus praeparationem acceſſerit, per conſequens eodem modo vitrum clarum efficit, quam cineres clavellati, ad quos nihil de tartaro aſſumitur. Quinetiam hoc in tartaro adhuc praeſens, vel alio quoque modo ſali alcalino conciliatum *Phlogiſton* utpote quod tantum & unice *ad cauſticitatem* confert, eſt ſubſtantialis iſta materia, quae ſpiritui inflammabili rectificatiſſimo tincturam conciliat, quanquam etiam ex parte ſpiritus ardens, qua menſtruum, ſi nempe ille *olei dives* ſit, non parum ad hoc contribuat, & *tinctura tanto magis acceleretur, & augeatur.* Quid mirum igitur, ſi ex ſale tartari extemporaneo cum 2 & 3 partibus nitri parato (quippe per quod omne inflammabile, & ad tincturam producendum abſolute neceſſarium deſtruitur) nullam tincturam recipias?

The Relation of fixed Alkaline Salts to other mixt chymical Bodies, and their preſent Application to Chymiſtry.

Quantum ſub definitione horum ſalium dixerim, ea conſiſtere ex terra, in qua parum fixioris vel ultimo magis concentrati ſalis acidi, & inflammabilis, mediante igne, toſtione quaſi & aſſatione impactum eſt, attamen eodem tempore ſimul adduxi, ut ex ipſis definitionis verbis, PARUM VEL ALIQUID, apparet, ſuperfluum ſive acidum, ſive inflammabile, imo ipſas terreſtres ſuperfluas partes, non modo non neceſſaria, ſed, & in reſpectu puritatis & perfectionis, quas ejuſmodi ſal requirit, praejudicioſa & nociva eſſe. Quod ſi purum quoddam Sal Alcali-fixum, ſive de induſtria, ſive per accidens, cum ſatis notabili & aucta portione unius antedictarum conſtituentium partium, ſive ſit nimium acidi, ſive nimium inflammabilis, ſive nimium partium terreſtrium, vel cum duobus horum ſimul, denuo tractatur & commiſcetur; tum novum hoc commixtum rurſus, *non modo aliam* plane *denominationem*, ſed & *plane alias qualitates & effectus*, ac antea ſolum Sal Alkali habuit, ſortitur. Nam, ſi Sal Alcali-fixum cum ſale acido tam diu commiſcetur, donec, poſt remiſſionem effervescentiae, & ſeparationem aquae, utpote quae tantum pro vehiculo ſolutionis inſerviit, ſyrupum violarum, ſi ejus aliquid admiſcetur, in ſuo colore non alteret, eumque nec rubrum, nec viridem reddat, tum appellatur *nova haec mixtio ſal medium, ſal ſalſum*, vel *ſal neutrum.* Quod ſi acidum minerale ad hoc adhibitum fuit, tum novum ejuſmodi mixtum facile *in cryſtallos* concreſcit; ſi vero acidum vegetabile uſurpatum fuit, tum *difficulter, vel plane non cryſtalliſari* poteſt. Cum autem in chymia *valde diſtincta ſalia acida* occurrant, proinde etiam juxta indolem iſtorum acidorum [ſi unum, vel alterum eorum,

cum

cum Sale Alcalino-fixo uſque ad ſaturationem unitum eſt] exinde productum *ſal medium* ordinario *denominationem accipit*, e. g. 1. Si Sal Alcali-fixum *cum acido vitriolico*, *ſeu ſulphureo*, ita commiſcetur, ut *cryſtalli* exinde emergant, tum ex his utriſque obortum cryſtallinum ſal medium plerumque *tartarus vitriolatus*, vel *polychreſtum* vocatur. 2. Si Sal Alcali-fixum, *cum acido nitri* commiſcetur, & cryſtalliſatur, perfectum inde *nitrum* cryſtallinum exoritur, quod *nitrum regeneratum*, vel etiam *tartarum nitratum* appellare conſueverunt. 3. Si *cum acido ſalis communis* ſaturatur, fit inde *ſal commune regeneratum*, ita dictum *ſal embryonatum*, vel *digeſtivum* Sylvii. 4. *Cum acido aceti* fit *terra foliata tartari*, ſeu, ſic dictum *arcanum tartari*. 5. *Cum acido tartari* oritur *tartarus ſolubilis*, ſeu *tartarus tartariſatus*. 6. *Cum ſucco citri tartarus citratus*. 7. *Pars alcalina*, quae *in ſale communi* reſidet, *cum acido vitriolico* ejuſmodi ſal medium conſtituit, quod *ſal mirabile* Glauberi vocant. 8. Quod ſi *pars alcalina nitri cum* dicto *acido vitriolico* commiſcetur, ita ut ex his duobus ingredientibus *cryſtallinum ſal medium* paretur, illud, quanquam in fundamento à tartaro vitriolato nihil differat, aliud tamen nomen recipit, dum ſcilicet ab innumeris annis *arcanum duplicatum*, vel *panacea Holſatica* appellatur. 9. Quod ſi vero ordinariis alcalinis plantarum ſalibus tantum ſuperfluum quicquam acidi, ſive à parte vegetabilis ipſius, ſive aliunde accedat, tum communiter inde *ſal cryſtallinum plantarum lixivioſum* oritur.

Si *Sal Alkali-fixum* cum *inflammabili* quodam miſceatur ſive ſint pinguedines, ſive expreſſa, quin & certis ſub enchireſibus deſtillata olea, exſurgit inde pro primo [uti notum eſt] Sapo, deinde vero etiam *ſal volatile & ſpiritus urinoſus*; quod ſi vero olei empyreumatici animalis quippiam accedit, tum hoc, cum eo etiam tantum impraegnatum, Sal Alcali, prae inflammabili vegetabilium, in curioſis quibuſdam laboribus non parum ſeſe diſtinguet. Si bituminoſum & acidum vitriolicum mixta [nempe *in ſulphure* communi] cum Sale Alcalino-fixo concurrunt, gignitur inde *hepar ſulphuris*. Denique, ſi purum Sal Alkali-fixum in igne, cum terra ſaturatur, puta pellucida, ut *arena* communi, *ſilice*, *pyrite*, *glarea*, & ſimilibus, tum non tantum *ſubtilis ſpiritus acidus* inde extorquetur, ſed & totum mixtum convertitur in pellucidam & tranſparentem, in igne quidem adhuc fuſibilem, in aqua vero amplius *indiſſolubilem terram*, nempe *vitrum*, vel etiam cum aliis additamentis in *porcellanam*.

In genere Salia Alcalia-fixa, non facile *ſeſe uniunt*, vel haec ſalia non facile quicquam *diſſolvunt*, quod non vel *inflammabilitatem*, vel aciditatem quandam continet, & *unum ſemper lubentius & intimius quam alterum*. 1. Sic Salia Alcalia-fixa facile quidem *diſſolvunt ſulphur* commune, quippe in quo *inflammabile & acidum* unita occurrunt; verum *facile* quoque ab eo rurſus *ſeparantur* & liberantur. 2. Facile quoque diſſolvunt, & ſeſe uniunt cum *axungiis*, *pinguedinibus & oleis expreſſis*, & communicant pinguibus hiſce materiis *diſpoſitionem* ſeſe cum ipſis

prompte

prompte *in aqua ſolvendi*, & cum aqua ſeſe uniendi, cum alias iſtae abſque Alcali-fixo unionem cum aqua omni modo fugiant & detrectent. 3. Salia fixa ſolvunt, & uniunt ſe quoque tandem cum *oleis deſtillatis* eſſentialibus, quamvis *paulo difficilius*. Et eadem cum differentia horum jam memoratorum duorum generum oleorum, eorumque faciliori vel difficiliori combinatione cum Alcali, *ſeparatio* quoque eorundem ſuccedit, dum Salia haec fixa à pinguedinibus, axungiis & oleis expreſſis perquam *facile*, & ab oleis aethereis, vel eſſentialibus, contra perquam *difficulter*, *vel plane non* ſeparari queunt, praecipue ſi ſemel intime cum iis unita, & utraque *in perfectum ſaponem* redacta fuere. 4. *Separatio ex vitris* equidem *tarde* aliquatenus ſuccedit, interim poſſibilis tamen eſt factu, quamvis in uno citius quam in alio (prae reliquis in *vitro ſilicum* omnium *facillime*) dummodo denuo cum Alcali ſecundum artem miſceantur, & debito modo tractentur. 5. *Cum ſalibus acidis* haec Salium Alcalino-fixorum *unio & ſolutio* fere omnium *facillime* & *promptiſſime* ſuccedit, & quidem *triplici modo* ; (*a*) Vel *miſcendo*, ſi utraque ſimpliciter abſque intermedio conjungantur ; (*b*) Vel *praecipitando*, ſi vel (*α*) ſal acidum, vel (*β*) ſal alcalinum fixum antea cum alio quodam corpore commixta fuere ; (*c*) Vel etiam *abſque praecipitatione*, dum ſal acidum equidem itidem antea cum alio quodam commixtum fuit, ſed hoc in acido ſolutum per praecipitationem exinde non ſeparatur. 1. *Miſcendo* peragitur haec unio, ſi Sal Alkali fixum in aqua ſolutum, vel etiam quod per ſe in deliquium abiit, cum ſpiritu, vel liquore quodam acido confunditur, prout in elaboratione diverſorum ſupra adductorum ſalium mediorum videre licet, *e. g.* in praeparatione terrae foliatae tartari, tartari tartariſati, nitri regenerati, tartari vitriolati ex ſpiritu vitrioli & oleo tartari per deliquium, *&c.* 2. *Praecipitando* abſolvitur haec unio (*α*) ; ſi *ſal acidum antea cum quodam* (A) *metallico*, vel etiam (B) *animali* combinatum & ſolutum fuit, id quod multiplici ratione, vel per accidens, vel de induſtria, fieri poteſt, & in Chymia Pharmaceutica ſaepius occurrit. (A.) *e. g.* in praeparatione auri fulminantis, in qua, ſi Sal Alcali ſolutum in aquam regiam auro ſoluto impraegnatam, infunditur, unio Salis Alcalici cum utriſque acidis (ſcilicet nitri & ſalis) praecipitando, vel cum proſtratione auri, contingit. Porro apparet hoc in praeparatione mercurii praecipitati albi, in elaboratione tartari vitriolati Tachenii, & aliis metallicis praecipitationibus permultis. (B) Circa *animales* ſolutiones videre licet ejuſmodi unionem Salis Alcalici cum acido itidem praecipitando factam, *e. g.* in praeparatione magiſterii cornu cervi, aliarumque partium animalium. (*β*) Alia ex parte peragitur haec unio modo praecipitationis, *e. g.* in preparatione ſulphuris antimonii ſic dicti aurati, in qua *Sal Alcali primum* ſolutis ſulphureis partibus impraegnatum deprehenditur, quod cum affuſo ſale acido ſeſe unit, ſolutum vero antea ſulphur praecipitando deſerit ; diſpaleſcit hoc porro, ſi commune ſmegma in aqua ſolutum cum acido praecipitatur, & hoc fit ubique,

ubi craſſe pinguia reſinoſa, vel ſulphurea, cum Sale alcalino fixo antea ſoluta & combinata fuere, poſtea vero cum acido praecipitantur. 3. Tertia methodus unionis, quae *abſque praecipitatione*, nec tamen ſimpliciter miſcendo abſolvitur, dum adhuc intermedium quoddam ſimul adeſt, *duplici modo* fieri poteſt; α Vel *ſi ſal acidum antea cum ſale volatili urinoſo combinatum, & in ſal ammoniacale redactum fuit*, ubi, ſi huic ſali volatili medio Sal Alkali fixum adjungitur, ſal acidum, praecipue ſi lenis tantummodo calor applicetur, repente novo huic advenienti alcali fixo ſeſe aſſociat, & deſerit ſal alcali volatile, quod antea continebat, quod tum dicto leni calore, tanquam deſertum & in ſe perquam volatile corpus, facile expelli poteſt; β. Vel ſiſtitur etiam hic unionis modus, *ſi Sal Alcali antea cum debiliori acido ipſo combinatum fuit*, fortius acidum affunditur, hoc novum mixtum in retorto vaſe igni exponitur: tum enim debilius acidum cogitur abſolute fortiori cedere, & deſtillando ſeparatur, quod in deſtillatione ſpiritus nitri & ſalis fumantis, aliorumque luculenter patet. Quanquam autem haec Salis Alcali fixi cum omnibus ſalibus acidis combinatio perquam *amice quaſi* peragitur, inde tamen *non exiſtimandum, ac ſi cum omnibus ÆQUALITER contingat*, vel cum uno eodem modo ac cum altero, *aequali firmitudine* ſeſe uniat. Minime! ſed & hac in re *ingens occurrit differentia*, dum in uno vel altero praeferentia (ut barbare loquar) ſeu *propinquior affinitas*, vel prout cuilibet denominare placet, *inter Sal Alkali fixum* & hoc vel illud *ſal acidum* obſervatur. Et cum haec *affinitatis ſcala* in Chymia *non parvi emolumenti*, ejuſque notitia Chymico practico perquam neceſſaria ſit, proinde de ea, iis praecipue, quibus iſta adhuc forte ignota eſt, quaedam in medium proferre ſuperſedere non poſſum, praeprimis cum ex combinatione Salis Alcalino-fixi cum ſalibus acidis, & ex ſcala iſta, quam jam producturus ſum, major *vis & fortitudo unius acidi prae altero* omnium optime annotari & dijudicari poſſit, nempe *in quantum ad combinationem cum alkali fixo ſeſe refert.*

Purum ergo *Sal Alcali fixum* omnium optime & *firmiſſime* ſeſe combinat cum fortiſſimo prae omnibus acido primigenio, puro puto, & *fixiore acido vitriolico & ſulphureo:* quod ſi hoc acidum adhuc cum principio inflammabili, ut communi ſulphure, commixtum prodit, tum intima ejuſmodi unio cum alcali non celebratur, ſed ſuperficialis tantum ſolutio ſeu cohaeſio emergit, &, ut ſupra jam notavi, fit *nudum hepar ſulphuris*, ex quo alcali *facillime*, imo *cum debiliſſimo acido vegetabili rurſus ſeparari poteſt.* Bona ex parte *firmius* acidum hoc ſulphuris Sali Alcalino cohaeret, ut ad minimum à debiliſſimo acido liberari non poſſit, ſi *portionem* tantum *inflammabilis*, quocum conjunctum fuerat, per deflagrationem *amiſit*, quod clare ſatis patet, ſi durante deflagratione ſulphuris, Sal Alcalinum fixum ea ratione applicatur, ut volatilis ſpiritus Sulphuris ei intricetur & irretiatur; interim tamen cohaeſio haec *non* eſt *ſatis firma*, dum volatilis hic ſpiritus *per* propriae quoque indolis, purius tamen, ab inflammabili plane depuratum &

magis fixum & *concentratum*, *acidum vitriolicum* rurſus inde expelli, & à Sale Alcalino fixo liberari poteſt, ex alia ratione nulla, quam *quia* bona ex parte *adhuc de principio inflammabili participat*, ex quo acidum iſtud adhuc volatile & ſubtile, per conſequens non ita purum & fixum exiſtit, ac oleum vitrioli rectificatum ; ſi vero ejuſmodi ſpiritus ſulphuris volatilis tantum per aliquod tempus *libero aëri* exponitur, tum tenerum hoc inflammabile plane *diſſipatur* & *exhalat*, reſtante è contra itidem puro, fixo, & cum alio ex vitriolo, vel alumine, deſtillato acido, in omnibus probis *æquali*, & in nulla re diverſo acido, quod tum cum Sale Alcali fixo, eadem ratione ac aliud purum, fixum, acidum vitriolicum, ſeſe quam *firmiſſime* commaritabit. Poſt hoc acidum ſulphureum, vel vitriolicum, unit ſeſe noſtrum Sal Alcali fixum lubentiſſime *cum acido nitri*, ſeu ſpiritu nitri. Et poſt hoc cum *acido ſalis communis*, ſeu *marini*. Denique omnium debiliſſime *cum acidis vegetabilium*, ut acido aceti, tartari, ſpiritu lignorum, ſpiritu ſacchari, ſucco citri, vino Rhenano, *&c.*

Ex his igitur ſufficienter addiſci poteſt, qua ratione novae ſemper combinationes Salis Alcalino fixi cum ſale acido perpetrari, & idem alcali aliquoties debiliori acido per fortius rurſus ſurripi poſſit, ubi autem in *ſcala hac* non deviandum eſt. Nam ſi Sal Alcali fixum cum puro acido vitriolico combinatum foret, tum utique nullum acidum ex omnibus aliis potens eſſet, hoc Sal Alcali fixum ipſi rurſus eripere, quia nimirum hoc eſt fortiſſimum omnium, & omnia reliqua acida ſunt multò debiliora, utpote quae ſingula contraria ex parte ab acido vitriolico ſeparari poſſunt. D. *Stahl* etiam ad hoc medium quoddam demonſtravit, qua ratione Sal Alkali ex acido vitriolico rurſus liberari poſſit: verum hoc non ſit mediante alio acido, ſed mediante additione principii inflammabilis, paucis per artificioſam ſulphuris formationem, per conſequens requiſito ad hoc labore in igne. Laudatus *Stahl*, *Anno* 1718, cum *Lutetiæ Pariſiorum* adhuc degerem, hujus liberationis cauſam, *novum* plane *problema*, ad iſtam ſulphuris geneſin plane non applicabile, in conſiderationem & ſolutionem per literas mihi propoſuit ſequentibus verbis: *Qua ratione Sal Alcali fixum ab acido vitriolico, prout utraque ſub figura cryſtallini tartari vitriolati apparent, in ſola cavitate manus, & unico in momento liberari poſſit ?* D. *Geoffroy* ſenior, cui problema hoc communicabam, Anno 1720, in Hiſt. Acad. Scient. illud imprimi curavit, & *putativam* hujus problematis *ſolutionem* annexuit ſed penitus *aberravit*, dum deſideratam hanc Salis Alcalini ſeparationem, de formatione ſulphuris diu jam cognita & publice nota, explicat & applicat ; haec vero ſulphuris productio plane *non in unico momento*, *multo minus in ſola cavitate manus*, *ſed in crucibulo igne candente fit*, vel perpetrari debet.

Circa combinationes praecipitatorias, in quibus metalla ſoluta fuere, adhoc obſervandum eſt, quod Sal Akali fixum, durante unione cum acido, cadenti ad fundum *metallo alterationem* quandam *imprimat*,

quae

quae non raro tantam mutationem involvit, ut talia cum ipſo praecipitata metalla perquam *difficulter in priſtinam malleabilem & fluxilem*, ſeu fuſibilem metallicam *formam* reduci ſeſe patiantur; cujus rei (ut aliquid tantummodo adducam) etiam ferrum, quod ex commixtione vitrioli martis cum Sale Alcalino fixo, in praeparatione tartari vitriolati *Tachenij*, ad fundum cadit ſufficiens teſtimonium perhibet.

Solent etiam noſtra *Salia Alkalina fixa*, praeter memorata ſuperius corpora, per ſe adhuc diverſa *corpora metallica ſolvere*, quanquam pro hac intentione aliqualis cauſticitatis gradus requiratur. (*a*) Solvunt proinde calcem *plumbi*, vel etiam plumbum tenerè raſum. (*b*) Solvunt itidem ſubtilem raſuram *cupri*, vel etiam cuprum è vitriolo praecipitatum, quin & cuprum in viridi aeris contentum. (*c*) Sic & *ſtannum* ſolvunt; (*d*) Ut & *regulum antimonii*, cum quo in calcem, imo etiam ultimatim, ſi fortiſſimo igne torquentur, plane in ſuccinei coloris vitrum convertuntur. (*e*) *Ferrum* ſolvunt duplici ratione; (1.) Vel dum cum nitro detonatur, & nitrum cauſticum ejus ope producitur; (2.) Vel etiam, ſi puram ſolutionem Salis Alcali fixi ſolutioni martis cum ſpiritu nitri antea factae infundo, prout hoc fuſius in Diſſertatione quadam ſub *Stahlio* de hac materia evolvi poteſt. Quod ſi vero fixum noſtrum Sal Alcali *antea ſulphure* bene *impraegnetur*, tum *omnia metalla*, (quaedam etiam ſemimetalla) nimirum *cuprum*, *ferrum*, *plumbum*, *regulus antimonii*, imo etiam *ſtannum & aurum* cum ipſo diſſolvi poſſunt. Denique, quod Salia Alcalino-fixa, Salibus Alcalino-volatilibus *ſiccam conſiſtentiam* conciliant, quod corpora alcalino-terrea non faciunt.

Solvunt etiam haec fixa ſalia tam ex ſpiritibus urinoſis, quam ex ſpiritibus inflammabilibus quoque ſuperfluam, & ſuperficie tenus tantum adhaerentem, *oleoſam* ſubſtantiam.

A large Quantity of Alcalious Salt produced by burning rotten Wood; by Mr Robie, *of* Harward College, *in* Cambridge, New-England. No, 366. p. 121.

III. A white Oak Tree, about 2 Foot Diameter, is in *Cambridge*, of ſo wonderful a nature, as that although about ⅓ of it was decayed, and ſeemed really to be rotten Wood, yet this decayed part, in burning, would turn almoſt wholly into a good white *Alkali*, and it would run down into hard Lumps white and clean. Such a Lump was brought us at College, to know what it was. We taſted it, and found it to be ſalt and very ſtrong. We diſſolved it in clean Water, and upon Decantation, and Evaporation without any Filtration, we produced a very clean white Salt, exceeding in Strength, and whiteneſs, any to be bought at the Shops. We tried it many of the ways of proving the goodneſs of an *Alkali*. Now although *Alkali's* may be extracted from common Aſhes, yet what was peculiar in this, is, 1ſt, That while it was burning, the Wood itſelf would melt, and run down into hard Lumps of Salt; and none of the Wood that was ſound, would do this, but only that which was decayed; and what was moſt decayed, would yield the greateſt quantity of Salt. And, 2. Whereas all other *Alkali's* of

Wood made thus by Incineration, are blackiſh at firſt, and a *Lixivium* made of them, although often filtred, will yet be tinged with a brown Colour, occaſioned from a kind of Coal, or Aſhes, ſo incloſed, as cloſely united to the *Alkali* in burning, as not eaſily to be ſeparated by Filtration, though often repeated, yet this *Alkali* was very white, even before Solution, and when diſſolved, the Lixivium was not in the leaſt tinged, but clear like pure Water, only a very ſmall quantity of Aſhes ſubſided to the bottom of the Veſſel, in which the Solution was made. The Lixivium thence decanted needed no Filtration, but when boiled up to dryneſs, the Salt remained fine and white. And 3. That in the burning of this Wood, as the Heat of the fire grew more intenſe, the Wood did, as it were, melt and clodder together in great Lumps, and did viſibly bubble and boil, with a hiſſing noiſe like the frying of fat in a Pan. 4. That whereas the weight of the *Alkali* Salt produced from other Woods in the common way of Incineration, is very inconſiderable, in proportion to the weight of the Wood producing it, yet this Salt nearly equalled in Weight, the Wood from whence it was taken. 5. Whereas the Aſhes of other Wood are never ſo replete with Salt, as that it can be ſeen, or in the leaſt cauſe the Aſhes to lump or clodder together; yet this, the whole of it, would gather into hard and ſolid Lumps of white Salt, as eaſily to be diſtinguiſhed from Aſhes (though white) as the pureſt Salt of *Tartar* made with *Nitre* would be. 6. That although from other rotten Wood much leſs of an *Alkali* can be produced, than from ſound Wood, yet here it is quite contrary, the decayed part of this Tree yielding, a large Quantity, and the ſound part, no more than other Wood. And we would firſt premiſe, that the Tree was ſtruck, in all probability, with Lightning many Years ſince, it being torn from it's top of the Trunk to the bottom, on that ſide which is now decayed, and which yielded the aforeſaid Salt, there being a Channel from top to bottom, about 5 Inches wide, as we ſuppoſe, at firſt, which the length of time had cloſed. And under this Bark, the Wood next to it was black; which we ſuppoſe was cauſed by the Lightning. From which things we conjectured, that the Wood having been thus expoſed to the Air and Water, for ſo long a time, this was the occaſion of it's becoming defective in that part; and that the Lightning having penetrated the Wood, had ſo altered and diſpoſed the Parts and Pores of it (the Figure and Texture of the parts appearing much different from other rotten Wood) to attract, receive in, and retain, the Nitrous Salt of the Air, which, through ſo long a ſpace of time, could not but be in great abundance. Even as Salt of Tartar, or other *Alkali's*, being expoſed to the Air for ſome conconſiderable ſpace of time, will be wholly reduced to a Nitrous Salt, (as *Glauber* ſays) and it's quantity alſo increaſed very conſiderably.

ſiderably. Not that the Lightning had ſo calcined the Wood, as to reduce it to a perfect Salt, but yet by penetrating of it, it had calcined it in ſuch meaſure, as to give it a like Propriety or diſpoſition, of attracting the Nitrous Salt of the Air, as aforeſaid *Alkali's* of Wood that have been fully calcined. Now if it ſhould be objected, that the Nitre in this Wood being volatile, would flee away in the burning of the Wood, we anſwer, that although Nitre cannot be fixed, and reduced to an *Alkali* Salt, by calcining it *per ſe*, yet it may ſo by the Addition of the powder of Charcoal. And here we ſuppoſe the Wood ſo altered by Lightning, in which this Nitrous Salt was lodged, as ſerved inſtead of Coal in the burning of it.

IV. 1. That the Salt, of late Years diſtinguiſhed by the Title of *Sal Catharticum*, is made from what, at the Salt Works, is called *Bittern*, is pretty commonly known; but the particular Manner how this *Bittern* is produced, and from it theſe Salts, has not yet as I know of, been communicated to the World, in ſuch a Manner as to become intelligible. And the *Opprobrium* unjuſtly caſt upon the Salt, of it's being a counterfeit *Epſom Salt*, or ſomething made in Imitation of it, or common Salt diſſolved and recryſtalized, has very much ſunk it's Eſteem among the Learned in Phyſic.

Obſervations and Experiments on the Sal Catharticum Amarum, *commonly called the* Epſom Salt. *By Mr* John Brown, *Chymiſt F. R. S.* No. 377. P. 348.

By the Account M. *Bolduc* gives in the Hiſtory of the Royal Academy of *Paris*, for the Year 1718, I find he did not ſucceed according to his Wiſh in the Experiments he tried, to find out what this Salt was made from, juſtly grounding his Reaſons for it's not being all made from the *Epſom* Waters, or other Springs that afford bitter purging Waters, on the large Quantities conſumed, and the Cheapneſs of it's Price. After all his curious Endeavours, it ſtill remained a Secret, until the Information he received from hence by Dr *Mendez*, whoſe Account is as follows, though very imperfect. It comes, ſays he, from *Lemington* and *Portſea*, both in *Hampſhire*, where from Heaps of foſſile Salt, there runs a ſaltiſh, bitter, ſharp, and pungent Liquor. One would judge by it's Brackiſhneſs and Bitterneſs, that it contained two Kinds of Salt, the one a Sea Salt, the other a bitter Salt. To ſeparate theſe Salts, they cauſe this Liquor to run through hollow Drains on the Ground; there it gets together, and condenſes into Salt; this they put into a large Veſſel, with a great Quantity of common Water, and boil it as long as is ſufficient to diſſolve it; then they let it cool and ſettle for ſeveral Days. The Water, impregnated with the Sea Salt, which is the heavieſt, ſinks to the Bottom of the Veſſel with the earthy Parts, and the Water impregnated with the bitter Salt, which is the lighteſt, ſwims at Top. They take off this upper Liquor, as long as it retains it's bitter Taſte, without any Pungency; afterwards they boil it in one or

two

two Waters, then evaporate it, and it yields white and tranſparent Cryſtals, which are the counterfeit *Epſom Salt.*

What Experiments M. *Bolduc* made with the *Bittern*, ſent him by that Gentleman, I do not remember to have met with, in any of the ſucceeding Memoirs.

Dr *Seipp*, in his Deſcription of the *Pyrmont* Waters, *Page* 127, ſays, that the common *Engliſh* purging Salt, which is ſold in great Quantities in *Germany*, under the Name of *Epſom Salt*, is not prepared from the *Epſom* Waters, but is made in *London* from common Sea Salt, and Oil of Vitriol. In the ſame *Page* he ſays, that the Salt obtained from the *Pyrmont* Waters will part with it's own acid Spirit, upon pouring on the *Ol. Vitriol.* which the *Sal Mirabile* and the *Engliſh* purging Salt will not. By this Means he diſtinguiſhes the firſt Salt from the two laſt.

Dr *Quincey*, in his *Prælect. Pharm.* ſays, there hath lately been contrived a Salt from the Mineral Purging Waters, made by Evaporation, Filtration, and Cryſtallization. It was firſt entitled *Sal Mirabile*, or *Sal Catharticum Amarum*; but it is now ſo ſcandalouſly counterfeited, that it is little elſe than common Salt diſſolved and recryſtallized.

Before I enter into the Account how this Salt is made, it may not be amiſs, firſt, to ſay ſomething of the genuine Salt that has been made from the bitter purging Waters, of which the learned Dr *Grew* was the firſt who attempted the making it at *Epſom.* Some Years after, ſeveral other bitter purging Springs were found in different Counties, and Salts in ſmall Quantities were boiled up from them, but from no Place, nor all the Places put together, in ſuch large Quantities, as from the Springs on one ſide of *Shooters-Hill* in *Kent*, about the Year 1700, which were then in the Poſſeſſion of thoſe two ingenious Chymiſts, Mr *George* and Mr *Francis Moult*; and where they made ſuch large *Apparatus* for evaporating the Water, that they have ſometimes boiled down 200 Barrels in a Week, from which, in a dry Seaſon, and when the Land Waters did not get into their Drains, they have obtained 224 Pound of Salt. After theſe Works had gone on ſome time, Dr *Hoy* found out a more expeditious Way of making a purging Salt ſo nearly reſembling that from the purging Springs, in all it's Properties, that it ſoon paſſed on the World for the other, and continued ſo to do. The great Conſumption of theſe Salts (which then went only by the Name of *Epſom Salts)* as well at Home as Abroad, engaged ſome of our Phyſicians, (many Years before M. *Bolduc* took Notice of it) to ſuſpect, that even what was made at *Shooters-Hill* was ſpurious, and received an Addition of ſomething to encreaſe the Quantity. But theſe Suſpicions, I dare poſitively affirm, were entirely groundleſs, as to the Salts made there, and readily believe the ſame of any other Place, where the Spring Waters were boiled

down for Salt. But upon a Conſideration, that there were greater Quantities of this Salt conſumed than all the Places where the Waters were boiled could produce, which was the real Fact at that Time of Day, there was ſufficient room to ſuſpect, that ſome of them were not genuine, as appeared to be true ſome time after. For the Secret, which was then in a few Hands, of making theſe Salts cheap, gave thoſe, who had it, an Opportunity of under-ſelling thoſe who made it from the Waters, and, in a Year or two, rendered them incapable of making it to any Advantage: So that the Work on *Shooters-Hill* was thrown up, and I believe there has not been 100 Pound of Salt made from the Waters ſince that Time, in any Part of the Kingdom.

Some time before this Work at *Shooters Hill* was broke up, ſome Pains was taken to diſcover the Secret thoſe had, who ſold the Salt ſo cheap; and upon examining the ſeveral Salts, that were ſold about Town, thoſe diſpoſed of by Mr *G.* and Mr *F. Moult*, were certainly genuine, and were therefore a proper Standard to judge of the reſt by. But from all the Experiments then made, there could no material Difference be found between the Salt made from the Waters, and that made by them who were in the Secret. There was indeed a Salt ſold by ſome, which in the Courſe of thoſe Tryals, was found to be a *Sal Mirabile*, made from the *Ol. Vitrioli* and common Salt, but ſhot into ſuch ſmall Cryſtals, as not at firſt ſight to be diſtingiſhued from the other. Neceſſity being the Mother of Invention, it was not long before it was diſcovered, and the Experiment was tried at the Lady *Carrington*'s Salt-Works near *Portſmouth*; where it was found the ſame thing could be done, as at another Work, not far from it, and in which Dr *Hoy* had been concerned. It was ſome Years after this Salt had been made at *Portſmouth*, before the Saltmakers at *Lemington* attempted, or indeed knew the Method of making it; who are now the greateſt Traders in it, and have ſent ſeveral Ton in a Year to *London*, beſides what has been directly exported from thence.

I remember it to have been the Opinion of the Proprietors of the Salterns near *Portſmouth*, that this purging Salt could not be made at any other Salt-Works except theirs, and that the bitter Taſte in the Salt was communicated from the Earth to the Sea Water, whilſt it ſtood expoſed in their Sun-Pans. But Time has proved this Opinion falſe; for beſides what has been ſaid of it's being made at *Lemington*, it was about 4 or 5 Years ago begun to be made near *Newcaſtle*, where it is ſtill continued to be made; and doubtleſs may be made at any other Salt-Works, where the common Salt is made from Sea Water by Evaporation. Whether any thing of this kind has been attempted at any of our Inland Salt-Springs, either in *Cheſhire*, or *Worceſterſhire*, I am not yet ſatisfied. There is ſome difference in the making the common Salt in *Hampſhire*, from that

about

about *Newcaſtle:* At the firſt of theſe Places, in the beginning of the Summer, at Spring Tides, or at New and Full Moon, the Sea Water is let into their feeding Ponds, which are their *Reſervoirs* for their Summer's working, and from hence is conveyed into ſmall ſquare Pans, and again, after ſome time, from theſe it is conveyed into larger Pans, or Beds, which they call Brine, or Sun-Pans; all which are made of Sea Mud and Earth. In theſe laſt Pans, or Beds, it lies expoſed to the Sun and Wind, in order to exhale the weakeſt Waters; and it is in theſe Beds, if the Weather prove very favourable, that they can make as good Bay Salt as any we have from *France*, and at ſuch a time they never bring their Brine to the Boilers. But if the Weather is not hot enough for that Purpoſe, their Brine is expoſed ſo long in theſe Pans, till it becomes of ſuch a Strength as to ſupport their Eggs, made of Glaſs or Wax, to a certain Height above the Surface of the Brine, which from thence is conveyed into large Store-Ciſterns, and then into Boiling-Pans made of Iron, where it is boiled down (after having been frequently ſcummed) to a Sea Salt. 'Tis obſervable, that whilſt the Brine is boiling, there precipitates a hard cruſty Matter, which is partly taken out by Veſſels placed in proper Parts of the Pan for that purpoſe, and part of it fixes on the bottom of the iron Pan ſo hard, as to be afterwards dug off; and this the Workmen call *Scratch*, and is what Dr *Collins*, in a former *Tranſaction*, concerning the Sea Water boiled at *Shields*, calls a Stone Powder. When the Operation for the Sea Salt is finiſhed, it is taken out hot, and put into wooden Troughs with Holes at the bottom, thro' which runs the ſuperfluous Liquor: Under theſe Troughs are ſet other Veſſels (with Sticks fixed in them in a perpendicular Poſture) to receive what runs thro'. In theſe Veſſels the Liquor is ſuffered to continue ſome time, and according to the Quantity of Sea Salt ſtill left in it, will cryſtallize to the Sticks, ſomething like Sugar-candy, but in much larger Shoots; and this they call *Cat-Salt*, or *Salt-Cats*, and it holds ſome Share of the bitter Salt. When this Salt is broken ſmall, or rather powdered, it is ſo white, that ſome Gentlemen chooſe it for their Tables; but the greateſt Conſumption of it is among the Cake Soap-Boilers. The Liquor that will not ſhoot to theſe Sticks, is what at theſe Works, they call the *Bittern*, fit for making the *Sal Catharticum*.

Continued by the ſame, No. 378. p. 372

2. Near *Newcaſtle*, their Method is to receive the Sea Water into their *Reſervoirs* at High-Water, at any Time of the Moon, if there be no Freſh in the River, occaſioned by Rain in the higher Country; and from theſe *Reſervoirs*, without expoſing of it in Beds, as at *Lemington*, they pump it into their Boiling-Pans, were evaporating it almoſt to a Pellicle, they fill it up again 8 or 9 times, and then waſte it with a gentle Heat for the common or Sea Salt. The Liquor, that runs from this Salt, when taken out, and put into proper Veſſels, is what they call the *Bittern*; which if it ſtands

ſtands ſome time in thoſe Veſſels, a Salt will ſhoot and cryſtallize to the Sides, in Taſte pretty much like Sea Salt, but with a ſhare of Bitterneſs, and ſeems to anſwer to the *Cat-Salt* of the *Lemington* Works, and very probably would ſhoot after the ſame manner, if they made uſe of the ſame *Apparatus.*

I could not but mention this general and looſe Account of making the common Salt, as neceſſary to introduce the Liquor called *Bittern*; which, before Dr *Hoy* found out an Uſe for it, was always flung away; being ſo different in it's Properties from the Brine made uſe of to produce the Sea Salt, that it would not boil up into a Sea Salt again, and required the niceſt Skill and Attendance of the Operator, to determine the Time when to take out the Sea Salt from the Pans, before the *Bittern* incorporated with it, which would otherwiſe ſpoil the whole making.

The *Bittern* at *Lemington* (as obſerved before) not ſhooting to the Sticks, is carried by Channels into Pits made tight with Clay, where it ſtands for ſome Months, and there will ſhoot again: What Liquor remains is boiled down, till it is obſerved to be in a Diſpoſition to cryſtallize, and then is conveyed into wooden Coolers lined with Lead: The Liquor, which will not ſhoot there, is boiled down after the ſame manner, in order for another Cryſtallization. By this time the Liquor ſeems to have altered it's Property, and becomes of a very pungent biting Taſte, and, if boiled down, will no longer ſhoot into Cryſtals as before, but precipitates, during the boiling, a ſmall grained Salt; and if you ſhould continue to boil down the Liquor, ſeparated from this Salt, each Quantity of Salt thus produced, will be ſtill more pungent than the other. If you boil down the whole Quantity of this Liquor, it will produce a Salt, which if expoſed to the Air, will run, *per deliquium.* The Liquor that produces this Salt, is always flung away, wherever the *Sal Carthaticum* is made.

This is what, at preſent, I can give no other Name to, than a third Salt produced from the Sea Water, differing, in ſome reſpects, as much from the other two, as they differ from one another.

To return to the ſeveral Cryſtallizations, ſuch as mentioned to be ſhot from the *Bittern*; theſe will be of different Sizes, as to their Figures, and hold ſome ſhare of the third Salt but now taken notice of, which makes them apt to give and diſſolve; nor is their Taſte come yet to that ſimple Bitter of the pure Salt. Theſe therefore are either ſeparately, or altogether, to be flung into a Copper, with as much common Water as is ſufficient to diſſolve them, and allow of a gentle Evaporation, till they are again ready to be poured into the Coolers in order for Cryſtallization. This generally proves to be the pure *Sal Catharticum*, throughly freed (as far as the Experiments I have tried can be convincive) from either a Sea Salt, or the third Salt. The Liquor decanted from this ſhooting, may be boiled down

again in order for a ſecond ſhooting, and after that a third; but as the Liquors from theſe ſhootings are boiled away more or leſs, ſo you will ſooner or later meet again with the pungent Liquor, which contains the third Salt, as you did in the former ſhootings from the *Bittern*, from which the pure *Sal Catharticum* is as neceſſarily required to be freed as from the common Salt; a Proof of which cannot be better determined than by one of the Experiments to be taken notice of hereafter, *viz.* that with the *Ol. Vitriol.* which will certainly ferment with this Salt, if the Sea Salt has not been well ſeparated from it, or if it ſtill holds ſome of the third Salt. And when any of the Cryſtallizations will not ſtand the Teſt of this Experiment, they ought to be diſſolved and ſhot again, as before, by which means the pure Salt is to be obtained. I do not mention this as a Trial made uſe of at the Salt-Works, but what I have by Experience found to be true. And the ſame Experiment will ſerve to diſtinguiſh a *Sal Mirabile* made at theſe Works, from that made with *Ol. Vitrioli* and common Salt. The Account they give of it is this: They take any Quantity of coarſer grained Cryſtals boiled from the *Bittern*, which when diſſolved and evaporated, more than they would otherwiſe do for making the *Sal Catharticum*, they throw into a wooden Bowl, with ſome Oil of *Vitriol*, where it ſtands for 10 Days, and ſhoots into large Cryſtals, tranſparent, and like the *Sal Mirabile:* But as this Salt, by this Method, is not ſufficiently ſatiated with the *Ol. Vitriol.* (if they uſe any) ſo it is eaſily diſcovered by the *Ol. Vitriol.* which will readily ferment with it; whereas it has no effect on the other *Sal Mirabile* made as above.

By the Aſſiſtance of *Robert Cay*, Eſq; at *Newcaſtle*, I have received the ſeveral ſhootings of Salts from their *Bittern*, as alſo ſome of the *Bittern* itſelf; from each of which I have obtained a pure *Sal Catharticum*, as alſo the like kind of third Salt, as mentioned from the *Lemington Bittern.* The Method I took in doing it is agreeable to that I have already mentioned, and many Years ago tried at the Salt-Works near *Portſmouth.* It is by Mr *Cay* that I am informed, they ſometimes boil their *Bittern* without letting it ſtand any time to ſhoot of itſelf. The Difference is not very material.

If this Account be intelligible, what the *Sal Catharticum* is, will no longer be a Myſtery. And the next thing worth the enquiring into will be, whether this Salt deſerves the Reflections, that have diſcouraged the Preſcription of it? And why it may not paſs for a Salt as excellent in it's kind, and be of the ſame Nature, and have the ſame Properties, as that produced from the *Epſom*, or any other bitter purging Springs. Dr *Grew* in his Treatiſe *de Natura Salis Cathart. Amari, Chap.* 2. ſays, that in the Evaporation of any of the bitter purging Waters, they yield a Cremor at top, as alſo a Sediment, both together weighing 6, 8, or about 10 Drams, from a Gallon

of

of Water; and that the leſſer Part of this Sediment is, in Subſtance, this ſame with the Cremor; the reſt is all Salt, but conſiſts of two ſorts, one a muriatic Salt, the other which is proper or peculiar to theſe Waters. In the *Epſom* Water, the muriatic Salt is about a 20th Part of the ſaline Mixture; in the *Dulwich* it is in greater Proportion, and the ſame in ſeveral others; it is, both in it's acrimonious Taſte, and Figure of it's Cryſtals, not unlike to common Salt. The other Salt is that which he ſays is particular or proper to the purging Waters, and is made by Evaporation and Cryſtallization. In this Preparation, firſt the earthy or plaiſtery Part is to be ſeparated, next the muriatic Salt, and laſtly, a brown and dark Liquor from the proper Salt of the Waters. And in the 4th Chapter of the ſame Part, having ſhewn the Difference of the Figure betwixt the Cryſtals of this Salt and thoſe of Alum, he goes on, Neither is there any better ground to account the purging Salt a Species of common Salt, from which being perfectly freed, it differs as much in Taſte as from Alum. And in the ſame Chapter, he ſays it will appear, the bitter purging Salt, altho' it hath ſome Qualities in common with other Salts, yet is truly, or ſpecifically different from them all. Thus far Dr *Grew*.

Now I cannot ſee any thing in this Account, but what will, *conſideratis conſiderandis*, very well agree with the purging Salt from the Sea Water. For, firſt, there is an earthy or plaiſtery Part contained in theſe Waters, and this muſt be ſeparated. The very ſame is in the Sea Water, and is precipitated in the boiling them down, as has been obſerved, and by the Operators is called *Scratch*. Next there is a muriatic Salt allowed to be in theſe Waters; in ſome more, in ſome leſs; and this is likewiſe to be ſeparated: The very ſame is done from the Sea Water, tho' in a vaſtly to larger Proportion. And, laſtly, there is a black and dark Liquor be ſeparated; tho' this is but an obſcure Way which the Doctor makes uſe of to expreſs himſelf, it cannot be better explained, than by what has been found to be Fact in boiling down the Waters at *Shooters-Hill*: That after ſeveral ſhootings of Salts by repeating the Boilings of the Waters, there would, at laſt, remain a Liquor of a deep-brown Colour, which would no longer yield a cryſtallized Salt; but, if boiled up dry, would afford a Salt of the ſame kind with the third Salt already mentioned: And this explaining Dr *Grew*'s black and dark Liquor, helps at the ſame time to prove, in this Article too, that the Sea Water affords the ſame kind of third Salt. I have tried ſeveral of the Experiments mentioned by the Doctor, by which he diſtinguiſhes his Salt from other Salts. Such as not affecting the Colour of Syrup of Violets; curdling of Milk when boiled; in the Figure of it's Cryſtals; in

it's eaſy Diſſolution in the ſame Quantity of Water; in it's coagulating with the *Ol. Tartar. per Del.* in it's Calcination, and in the Bitterneſs of it's Taſte, as well before as after Calcination, *&c.* and find this Salt thus ſeparated from the Sea Water, anſwer to all the Trials. Some few Experiments, that the Doctor has not taken notice of, I ſhall here ſubjoin, and then leave the Whole to the Opinion of better Judges; Whether there be any ſpecifical Difference between theſe two Salts?

In order to have a Standard for theſe Experiments, I purpoſely got Mr *Hyet*, Apothecary at *Epſom* (whoſe Fidelity I could depend on) to boil me down ſome of their Waters; which he did from the Well in the Town, and ſent me a ſufficient Quantity of the Salts, to anſwer the Purpoſe I wanted them for. I procured likewiſe ſome of the firſt Salts from the *Lemington Bittern:* Theſe do not hold ſo much of (what I have already diſtinguiſhed by the Name of) the third Salt, as I find the *Newcaſtle* Salts do. This *Lemington* Salt, I, for Diſtinction-ſake, call the *firſt Lemington Salt.* Part of this I diſſolved, and ſhot into pure *Sal Catharticum*, being freed, as well from the Sea Salt, as the third Salt; and this I call the *ſecond Lemington Salt.* I procured likewiſe from *Newcaſtle* the firſt Salts ſhot from their *Bittern*, which I call the *firſt Newcaſtle Salt.* Part of theſe I likewiſe diſſolved and ſhot, and obtained a pure *Sal Catharticum*; and this is what I call the *ſecond Newcaſtle Salt.* I am obliged to make uſe of the *Sal Mirabile*, made from the *Ol. Vitriol.* and common Salt, that having been taken for the *Sal Catharticum* As alſo common Salt, that having been repreſented as the principal Subſtance of the *Sal Catharticum.*

I took ℥ ſ. of each of theſe Salts, and diſſolved them in about ℥ ij. of Water to each ℥ ſ. of Salt. A ſmall Quantity of each Diſſolution I poured into as many Glaſſes, and dropped into them all ſome *Butyr. Antimonii.* The Precipitation that followed, ſeemed to be alike in them all; and upon dropping a little *Ol. Vitriol.* into each, what was precipitated being more powerfully attracted by the Oil, the ſeveral Liquors became clear. Theſe are the two only Experiments, in which I found the Conſequences ſo much alike in them all.

In the following Experiments, the *Sal Mirabile* is ſufficiently diſtinguiſhed from all the reſt. Slices of Gall cut into theſe ſeveral Solutions have no manner of Effect upon any, except that of the *Sal Mirabile*, which is ſoon tinged of the Colour of Sack, or rather deeper. *Sp. Sal. Arm. c. Tart.* dropped into the ſeveral Solutions turns them all milky, except that of the *Sal Mirabile*, which keeps it's Tranſparency. The *Sp. Salis Armon. c. calce.* the *Ol. Tart. p. deliq.* the *Tinct. Coccinell. in Sp. Vin. fact.* do every one, uſed after the ſame manner, ſufficiently diſtinguiſh the *Sal Mirabile* from all the reſt.

In the following Experiments, the *Epſom* Salt, the ſecond *Lemington* Salt, and *ſecond Newcaſtle* Salt, agree together, and differ from the common Salt, the *firſt Lemington* Salt, and the *firſt Newcaſtle* Salt. In the ſeveral Solutions I dropped a Solution of Silver in *Aq. Fortis*, from which followed theſe Conſequences. The Solution of the *Epſom* Salt, *ſecond Lemington Salt*, and *ſecond Newcaſtle* Salt, became equally milky, before the Precipitation. The Solution of the Sea Salt, and *firſt Newcaſtle* Salt, let the Precipitation paſs without receiving any milky Tinge. The *firſt Lemingtou* Salt, as holding leſs of the *third* Salt, than the *firſt Newcaſtle* did, took a little milky Tinge. The Precipitation fell nimbly thorough the Solution of the *Sal Mirabile*, leaving it milky.

In the Condition theſe were in, I poured ſome *Ol. Tartar. per deliq.* to each of them; on which, after ſome time, a bluiſh Scum aroſe on the Surfaces of the *Epſom* Salt, *ſecond Lemington* Salt, and *ſecond Newcaſtle* Salt: There likewiſe appeared a little on the *firſt Lemington* Salt, but not any on the reſt.

A Solution of corroſive Sublimate was made in Water, 10 Drops of which, mixed with the ſeveral Solutions, produced little or no Alteration; but upon dropping in the *Ol. Tartari per deliq.* the following Appearances were produced: In the Solution of the *Epſom* Salt, *ſecond Lemington* Salt, and *ſecond Newcaſtle* Salt, the Precipitations were red; in the Solution of the common Salt, and *firſt Newcaſtle* Salt, the Precipitations were white; in the Solution of the *firſt Lemington* Salt, the Particles precipitated approached pretty near the Colour of the three firſt.

I took ſome of theſe ſeveral Salts in Subſtance, and to each of them poured a little *Ol. Vitriol.* which is one of the Experiments Dr *Grew* tried upon his Salt, and which he ſays cauſes a moderate Ebullition, whereby it appears to partake of an alkaline Principle: But without looking for this alkaline Principle from it's fermenting with an acid, (Terms juſtly exploded by the learned Dr *Freind* in his *Prælectiones Chymicæ*) I am inclined to believe, that the Salt on which he tried the Experiment had not, according to his own Directions, been thoroughly ſeparated from his muriatic Salt. For this Oil poured on the *Epſom* Salt, *ſecond Lemington Salt*, and *ſecond Newcaſtle* Salt, produced no ſenſible Fermentation. On the Sea Salt it acts with Violence, forcing off it's acid Spirit with an inſufferable *Gas*. The ſame Effect in proportion it had on the *firſt Lemington* Salt, and *firſt Newcaſtle* Salt; none at all on the *Sal Mirabile*, as being a Sea Salt already ſatiated with the Oil.

What I have all along called the *third* Salt, anſwers in moſt of theſe Experiments to the Sea Salt, and yet has ſome Properties exceedingly different from it; to thoſe I have mentioned theſe may be added; it will not decrepitate like Sea Salt; it readily melts, when

when put in a Crucible in the Fire; and when calcined till red-hot, affords a *Calx* equal to, if not ſtronger than, a Lime-ſtone, and ferments violently, as well with Water as with *Ol. Vitriol.* This *Calx*, when expoſed to a moiſt Air, will part of it run *per deliq.* but not ſo ſoon as before Calcination. All theſe Properties differ in every reſpect from the common Salt, and leave me ſtill in doubt what to call it, as alſo how far Experiments of this kind may be deemed concluſive.

An Account of the Quantity of Reſin in the Cortex Eleutheriæ; *by Mr* John Brown, *Chymiſt, F. R. S.* N° 371. *p.* 81.

V. Dr *Douglas* having lately delivered in a Paper to be read before this Society, giving an Account (from the Hiſtory of the Royal Academy at *Paris*) of the *Cortex Eleutheriæ*; and among other things having ſaid of it, that Monſ. *Boulduc* had from ℥i. of the Bark, by means of Spirit of Wine, gotten ℥ v. of Reſinous Extract, there remaining ℥ iij. of *Fæces*; and that Gentleman's Account of ſome of the Properties of this Bark being founded on the quantity of Reſin ſuppoſed to be contained in it: I propoſed to Dr *Douglas*, and ſome other Gentlemen of the Society, (who agreed with me in believing, that ſcarcely any part of any Plant whatſoever would yield that quantity of Reſinous Extract) to try the Experiment, which was performed after the following manner: I took ℥ ij. of picked Bark, and digeſted it in rectified Spirit of Wine, which was often decanted and freſh Spirit put on, until the Bark would yield no more Tincture. The impregnated Spirit being evaporated by a very gentle Heat; there was left ℥ ij. of Reſinous Extract; the Remains of the Bark dried, weighed ℥i. ℥ij ſ℈; the Loſs this way is ℥iij ſ℈. I boiled theſe Remains in ſeveral Waters, until they would no longer tinge the Water, which being evaporated, yielded ℥i ſ℈. of Extract; the Remains of this dried weighed ℥i. ℥ ſ℈; the Loſs by this Method is ℥ ſ℈. I took ℥ ij. more of picked Bark, and boiled it in ſeveral Waters, till the Bark gave no more Colour; and then upon an Evaporation of the Water, had ℥ ij. of Extract. The Remains being dried, weighed ℥ i ℥ vi; here the Loſs was not any thing, except ſo much as might anſwer in weight to the quantity of the *Menſtruum* left in the Extract, which Allowance muſt likewiſe be made in the other Extracts. I digeſted the Remains in rectified Spirits of Wine, until they no longer tinged the Spirit, and by a very gentle Evaporation, I found remaining ℥ i. of Reſinous Extract. What was left, when dried, weighed ℥ i. ℥ij ſ℈; in this the Loſs was ℥ ij ſ℈. The Difference in the quantity of Extract obtained by theſe two different Methods, is but ℥ ſ℈. and the Medium between them, upon putting together the ſeveral Extracts made with Spirit of Wine and Water, is in the whole but ℥iij. 15. *gr.* But the Extract made with Spirit of Wine alone, is no more than ℥ij. from ℥ij. of the *Cortex*, inſtead of ℥x. which it ought to have yielded according to M. *Boulduc.*

VI. Non-

VI. Nonnulli negotiatores in *Hollandia*, *Anglia*, *Hamburgi*, *Dantiſci*, &c. qui maxime in coëmendo & divendendo Spiritu Vini Gallici occupati ſunt, certum aliquod experimentum probatorium crepant, idque pro magno artificio ac ſingulari arcano venditant, firmiter perſuaſi, ſe ope hujus experimenti non ſolum ſpiritum vini Gallici à ſpiritu frumenti, ſed etiam genuinum ab adulterato diſcernere, atque ita in coëmendo genuino ſpiritu vini Gallici, nequaquam defraudari poſſe. Hinc etiam tanquam indubitatum & infallibile probamentum, imo magnum aliquod arcanum, quod non omnes calleant, adhuc exiſtimatur, adeo, ut nemo hunc liquorem probatorium, nec olfaciendum, neque guſtandum mihi concedere unquam voluerit, tametſi fide interpoſita proteſtabar, me illorum commercio nec nociturum, nec artem hanc cum aliquo communicaturum. Quid quod nec ego ipſe, nec illi praenoſcere quibant, utrum ego nudo olfactu vel guſtu conjectando illico aſſecuturus eſſem, quidnam rei ſit, & qua ratione paranda eſſet?

The common Experiment uſed to prove French *Brandy, ſhewn to be falſe and fallacious; by Mr* C. Neuman, *Chym. Prof. Reg.* Berolin. *F. R. S.* No. 391. *p.* 398.

Subjectum liquor quidam eſt ſubfuſco-flaveſcens, quo adhibito mercatores experimentum iſtud ita peragunt. Complent primo ſcyphum vitreum ſpiritu vini Gallici probando, deque liquore iſto in ſcyphum illum vel unicam, vel duas treſve guttas, pro quantitate ſpiritus vini infuſi, inſtillant. Quod ſi bonus fuerit & genuinus ſpiritus vini Gallici, ſtatim in fundo vitri impleti exiſtit admodum caeruleus color pulcherrimus, qui ſi caule mundiore agitatur, cum reliquo ſpiritu permiſtus, totum vitrum colore cyaneo tingit; ſin autem ſpiritus frumenti ſit, ne quicquam cyanei coloris in vitro conſpicitur, ſed ſpiritus ille colorem ſuum primigenium retinet, etiamſi de liquore dicto vel vigecuplo plures guttae ſcypho impleto inſtillentur. Sicuti igitur hic modus probandi generatim, putum frumenti ſpiritum à puro puto ſpiritu vini Gallici, ex opinione Mercatorum diſcernit: ita hi conſequenter hac hypotheſi fidentes de utriuſque ſpiritus vini & frumenti adulterinae commiſcelae gradibus diverſis judicant. Norunt enim ex conſpecto colore caeruleo, niſi hic obſcure talis, ſed ſubcaeruleus modo, caeſius, glaucus, aut ex cyaneo virideſcens appareat, dijudicare, ſpiritum vini non ſolum adulteratum, ſed etiam quoad gradus tot pluſve minuſve partibus ſpiritus frumenti mixtum eſſe.

Equidem lubens fateor, hanc rationem probandi ſpiritus, ubi primum eam animadvertebam, admiratione quadam & delectatione me affeciſſe, ita ut eam omnino certam & falſi neſciam primo adſpectu crederem, quo etiam magis nunc talibus Mercatoribus & Oënopolis, rerum Chymicarum ignaris, inſcrutabilem ſibi errorem condonare poſſum. Quum autem animo mecum ſubinde agitarem, quod nullum adhuc, quantum ſciam, demonſtrativum experimentum proſtat, cujus ope peculiares puri ſpiritus vini Gallici & quidem rectificatiſſimi partes conſtitutivas à ſpiritu frumenti

aeque rectificatiſſimo diſtinctas oſtendere vel ſaltem ſuſpicari poſſimus, ſed quod uterque ex iiſdem partibus eſſentialibus conſtet, in quam communem qualitatem ſimpliciter neceſſaria fermentatione rediguntur, ideo argumentatus quoque mecum ſum, quod ſi qua notabilis diverſitas in dictis ſpiritibus eveniret, ea non à mixto intrinſeco tanquam mixto ſpiritus vini formante, vel à vini indole, ex quo ſpiritus deſtillatus fuit, ſed neceſſario ab additamento quodam heterogeneo, ad conſtituendum ſpiritum vini, qua talem, nullo modo pertinente, ortum ducat, ſive ſub fermentatione aut deſtillatione peregrinum quid addatur, ſive tingendo, extrahendo, vel ipſa commiſcela aliorum liquidorum aut ſolubilium contingat.

Meum non eſt in ſolis ejuſmodi cogitatis, praecipitatis ut plurimum & fallacibus, acquieſcere ; quare varia ad rem pertinentia, experimenta inſtitui, quibus etiam facile impetravi conjecturae meae confirmationem, quod ſcilicet in iſta per dictum experimentum apparenter proveniente diverſitate, nulla ſit ratione ſpiritus ardentis vera & eſſentialis diſtinctio, ſed quod productio coloris caerulei, ex quo differentia judicatur, heterogeneo cuidam, & ad ſpecialem conſtitutionem ſpiritus vini plane non requiſiti additamento debeatur, atque ita totum experimentum, quacunque demum veriſimilitudine ſeſe commendans, falſum ſit, fallax, & inutile, id quod jam ulterius comprobabo.

Praemonendum autem mihi eſt quod, cum de additamento hoc ſpiritus vini, liquore ad experimentum pertinente deſtitutus, certior fieri non aeque poſſem, operam dederim ſedulam, dictum modo liquorem, utpote ipſummet artificium laudatum, adinveniendi, quamvis ab initio parum in id concitatus, quod eum nunquam, ceu dixi, neque guſtu, neque odoratu ſentire, nec niſi ſub inſtitutis experimentis, eminus intueri licuerit, neque etiam difficultate ſua caruiſſent eum explorandi tentamina (quamvis, ut apparebit, ſimplex ille ſit & ſatis notus) niſi ab amico, qui *Gedani* eum quondam guſtaverat, percepiſſem, quod ſtyptico ſapore ſe exhibeat, quorſum cum omnia mea experimenta dirigerem, tandem reperi, quod arcanum illud tanto in pretio habitum aliud nihil ſit, quam mera ſolutio Martis in acido vitriolico, ſive ex Marte cum ſpiritu vitrioli ſoluto, & cum aqua diluto, ſive ex vitriolo Anglico, ſive ex vitriolo quodam Venereo-Martiali, praecipitando parato, ſive ex minerae cujuſdam Martis, qualis Haſſiaca eſt, extractione conſtet, quamvis color caeruleus omnium elegantiſſimus cum ultima, nempe cum ſic dicto liquore terrae Martis ſolaris appareat, quo ſaturatior ſolutio eſt, eo minus ejus pro experimento faciendo requiritur.

Additamentum autem illud flavedinem primum ſpiritui vini Gallici concilians, hinc & ſub experimento caeruleum colorem provocans,

vocans, lignum quercinum eſt, ſive ſegmenta aut ramenta ejus cum ſpiritu vini infundantur, ſive in dolio quercino novo ſervetur ſpiritus, uſque dum flavedinem ex ligno extraxerit ; quo magis autem flaveſcit ille, eo magis coeruleus quoque cum liquore martiali evadit ſub experimento, niſi croco vel alia quadam re flava tinctus fuerit.

Quod autem totum negotium non niſi ligno quercino debeatur, experimento ſequenti in contrarium facto, confirmo : Aſſumo nempe ſpiritum frumenti, eundem, qui cum liquore neque coeruleum colorem exhibet, neque ullam aliam mutationem ſubit, atque ideo à mercatoribus pro puro frumenti ſpiritu judicatur, huic indo ramenta quercina, & infuſa relinquo, donec ſpiritus frumenti flavedinem ſpiritus vini Gallici fere contraxerit, filtrato huic ſpiritui dum liquorem vitriolicum, ſicuti ſpiritui vini Francici, inſtillo, eundem colorem coeruleum & aeque elegantem acquiro, nulla ne leviſſima quidem diverſitate, aut diſſimilitudinem indicante phaenomenon interveniente ; quod abunde teſtatur, omnem mutationem coloris ex ligno quercino originem ducere.

Poſſumus quoque ſpiritum frumenti cum alio quodam, analogia ad lignum quercinum accedente, cum Gallis, *v. g.* infundere, ſequente ſimiliter experimento. Succedit quoque res quodammodo cum cortice granati & aliis vegetabilibus adſtringentibus, omnium tamen optime cum ligno quercino, cui cortices granatorum longe ſunt inferiores, violaceum potius, quam coeruleum colorem, & cum agitatur, viroris aliquid trahentem, exhibentes.

Notatu dignum eſt, quod perparum liquoris ex ligno quercino extracti ſufficiat ad qualitatem ſpiritui frumenti bene multo inducendam, pro coeruleo colore, cum dicto ſaepius liquore, exhibendo, ſiquidem cum gutta unica infuſi ligni quercini dimidiam ſpiritus frumenti unciam pro experimento ſubeundo aptam reddidi.

Liquorem ſive ſolutionem ex puro vitriolo Martiali, nullatenus Venereo, conſtare & paratam eſſe debere, exinde apparet, quod experimentum 1. cum Goſslarienſe, Ungarico, Dantiſcano, omnibuſque ſimiliter mixtis vitriolis, quae qualitercunque venerea vel cuprea ſunt, pro copia cupri commixti plus minus male ſuccedat, & colorem valde dilute coeruleum, ſeu caeſium producat. 2. Quod cum puro vitriolo Veneris plane non ſuccedat, nec ullum colorem coeruleum provocet, ſicuti id variis experimentis, infra in ejus teſtimonium allatis, tentando didici.

Dicendum adhuc reſtaret ut, quibus de cauſis & quomodo color iſte coeruleus oriatur, explicarem ; quia vero rem pro incipiente, vel diluto, atramentorio ſcriptorio habeo, cujus ingredientia, colorem ſuppeditantia, praecipua ex iiſdem, nempe ex vitriolo Martis & adſtringente vegetabili conſtant, de quibus *D. Lemery* ſcite & copioſe diſſeruit (*v.* Hiſt. de l'Acad. des Sciences An. 1707.)

hunc potius allegare volui illis, qui talibus delectantur, quam obſervationem hanc meam allegatis hujuſmodi complere & extendere. Qui opticis aliiſque Philoſophicis rationibus capiuntur, D. *Boyle*, D. *Newton*, & alios legant, qui de coloribus ſcripſerunt.

Sub finem diſcurſus mei paucis commemorabo, quod inter Gallici vini & frumenti ſpiritum, purum nempe hunc & cum cura deſtillatum, non alia quam peculiaris odoris & ſaporis in Francici ſpiritu vini à vinaceis, petiolis & acinis uvarum oriundi differentia indagari debeat, licet idem quoque odor & ſapor variis modis ſpiritui frumenti conciliari, atque hic ita in Francicum adulterari queat, ut eam vel peritiſſimus pro genuino Francico aut ad minimum pro frumenti ſpiritu plane non habuerit, unde apparet, quod uti primo allegatum, ita & alia experimenta ſpirituum ardentium probatoria nullius, vel ſaltem inſufficiantis uſus ſint.

An Account of the Experiments.

I. Octuplas paravi ſolutiones vitriolicas, pro qualibet drachmas duas vitrioli & unciam unam cum dimidia aquae communis deſtillatae recipiendo. Habui autem ſolutiones vitrioli. 1. Goſlarienſis; 2. Gedanenſis; 3. Hungarici; 4. De Cypro; 5. Anglici; 6. Martis cum oleo vitrioli parati; 7. Martis ex vitriolo venereo martiali per praecipitationem facti, & 8. ſolutionem minerae Martis Haſſiacae, vel ſic dictae ſolaris, cujus itidem binas tantum drachmas ad dictam aquae quantitatem aſſumpſi. II. Triplices feci adſtringentium vegetabilium extractiones per infuſionem, ad quamvis unciam vegetabilis libram unam medicam ſpiritus frumenti, qui à liquore probatorio antea inſtillato nihil plane coerulei oſtenderat, accipiendo; fuerunt autem extractiones, 1. Ligni quercini; 2. Gallar. Turcic; 3. Granatorum corticum. III. Cum tribus hiſce admodum ſaturatis extractionibus, triplicem quoque Gallici vini ſpiritum adulterinum, colorem ſaltem & flavedinem imitando, ex frumenti ſpiritu effinxi, & quibuſvis octo ſpiritus frumenti unciis unam extractionis unciam ſingulatim commiſcui. IV. Ordinarium ſumpſi ſpiritum vini Gallicum flaveſcentem, atque etiam ordinarium recens deſtillatum ſpiritum frumenti, & de utroque, ſecundum ordinem modo dictum cum ſolutionibus vitriolicis, experimenta cepi ac ſucceſſive inſtitui. V. Infudi nempe quavis vice ℥ ß. ſpiritus vini Francici in vitrum mundum infra acuminatum, & ſolutionis vitriolicae unicam, vel ſi non ſufficeret ad coeruleum colorem proferendum, 2, 3 uſque ad 4 guttas inſtillavi, vidique diligenter attendendo, quod ſpiritus vini Gallici dictus 1. cum ſolutione vitrioli Goſlarienſis pallide coeruleum, 2. cum ſolutione vitrioli Gedanenſis, & 3. vitrioli Hungarici itidem ſubcoeruleum, 4. cum ſolutione vitrioli de Cypro autem nullum plane coeruleum, ſed ſubvirideſcentem colorem induerit, 5. cum ſolutione vitrioli Anglici, atque 6. cum ſolutione vitrioli Martis, cum oleo vitrioli parati, itidemque 7. cum ſolutione vitrioli Martis per

praecipitationem facti, valde elegantem, sed cum liquore Martis solari sic dicto, seu solutione minerae Martis Hassiacae, amoeniſſimum colorem coeruleum acquiſiverit. Cauſam diverſitatis hujus ſupra jam dedimus. VI. Cepi porro pro quovis experimento probatorio dimidiam itidem ſpiritus frumenti unciam, & cujuſvis ſolutionis vitriolicae 1, 2, 3, imo 10 & plures guttas inſtillavi, ſed à nullius neque etiam ipſius liquoris ſaepius dicti commiſcela, quamvis plus ad hunc, quam ad Gallici vini ſpiritum additum fuerit, ullam ne leviſſimam quidem livedinem coerulei coloris obſervare licuit. VII. Poſtmodum aſſumpſi dicti ſub numero III, & de eodem ſpiritu frumenti, triplici modo imitando effecti ſpiritus vini Gallici ℥ ſß. pro quovis experimento, eandemque cum ordinario ſpiritu vini Francici factam, ac ſub numero V, commemoratam inſtillationem cujuſvis ſolutionis vitriolicae inſtitui, & ecce conveniebant experimenta cum genuino, & cum adulterato hoc ſpiritu vini Gallici facta, per omnia phaenomena; niſi quod propter combinatas variorum vegetabilium extractiones aliqua hinc inde, quamvis admodum levis differentia interveniret, uti ex ſequentibus apparebit. VIII. Spiritus frumenti cum extractione gallarum ab inſtillata ſolutione vitrioli 1. Goſlarienſis, itidemque 2. Gedanenſis nigreſcebat quodammodo, 3. cum ſolutione vitrioli Hungarici ab initio, ſub inſtillatione, dabat quidem aliquid coerulei, ſed inter commiſcendum perdebat penitus, 4. cum ſolutione vitrioli de Cypro plane non tingebatur, 5. cum ſolutione vitrioli Anglici eleganter coeruleſcebat, & 6. cum ſolutione Martis utroque modo parati, ab initio quidem coeruleo, ſed commiſcela vero & interagitatione cum caule pennae, violaceo colore tingebatur; denique 7. cum ſolutione minerae Martis, & quidem una ſaltem ejus gutta, mixtus hic ſpiritus frumenti egregium acquiſivit colorem coeruleum. IX. Spiritus frumenti extractione corticum granatorum, ceu dictum, imbutus, cum ſolutionibus vitriolicis, juxta ordinem praecedentem confuſus, parum vel nihil coerulei provocavit, & circa priora quatuor puncta, eodem fere modo, ſe exhibuit, atque ſupradictus frumenti ſpiritus gallarum extractione impraegnatus, in poſterioribus quoque experimentis mox viridiuſculi quid, mox atramenti aemulum oſtendebat. X. E contrario ſpiritus frumenti extractione ligni quercini in ſimilitudinem quandam Gallici infucatus, cum ſolutionibus vitriolorum pure martialium, & prae caeteris cum liquore Martis ſolari, omnium pulcherrimo colore coeruleo inficiebatur. Cum primis quatuor ſolutionibus vitriolicis vero eodem ſe modo habuit, ac caeteri ſpiritus frumenti fucati, imo non ſecus ac ipſe ſpiritus vini Gallici. XI. Tandem cum ſatis eſſem confirmatus, rem cum ramentis ligni quercini optime ſuccedere, experiri libuit, quantum infuſi vel extractionis ligni quercini, ad minimum pro aliquali ſaltem coeruleato colore producendo requi-

reretur. Varias ergo quantitates minuendo ſemper parciores, à 3ſs. ad 20, 15 & pauciores guttas deſcendendo, probavi, adeo ut unica gutta ſufficeret totam ſemiunciam ſpiritus frumenti qualitate impraegnando, quae ad colorem coeruleum, licet non adeo ſaturatum, unica ſaltem gutta liquoris minerae martis accedente, producendum requiritur.

An Account of a Spiritus Vini Æthereus, *with ſeveral Experiments tried therewith; by Dr* Frobenius, *F. R. S.* No. 413. *p.* 283.

VII. Exp. 1. The Æther of Plants appears to be almoſt deſtitute of all groſs Air, from placing it under the Receiver of the Air-Pump; for exhauſt the Air ever ſo accurately, this Ætherial Liquor remains unmoved, nor does it emit any Air-bubbles which immediately ariſe in other Liquors, and according as their Quantity of intrinſic Air is greater, ſo much the ſooner are ſuch Liquors put into Agitation, and emit alſo more Froth, and more vehement Ebullitions in proportion to their Viſcidity. Hence it follows, that this Æther may be preſerved beſt (becauſe without any Diminution) under the Receiver in *Vacuo*, whereas on the contrary, expoſed to the open Air, it's Parts ſoon evaporate, and it's whole Bulk, but not compreſſed by the Air, vaniſhes. (*This Experiment failed remarkably.*)

2. A little of it poured on the Surface of the Hand, affects it with a Senſe of Cold equal to that from the Contact of Snow, and blow upon it but once or twice with your Mouth, immediately your Hand becomes dry. Beware however of approaching a lighted Candle with your Hand thus wet, leſt it take Fire and burn you. (*Succeeded.*)

3. It cauſes ſuch a Stridor and Hiſſing, being poured upon hot Water, as is frequently occaſioned by a piece of hot Iron thrown into it. Take a Lump of Sugar, imbibe ſome of this Æthereal Liquor, and put it into a Veſſel full of hot Water, the Sugar will indeed ſink to the Bottom, but the æthereal Liquor ruſhing violently forth, excites a great Ebullition in the Water. If one Spoonful of this Æther be poured into a Copper-pot-full of boiling Water, without any Sugar in it, and approach immediately with a Candle or a lighted Paper, inſtantly there iſſues forth from the Water very great Lightning. The Handle of a Spoon, as well as the Tongs for holding and applying the lighted Paper, muſt be of a proper Length, that the Effuſion of the æthereal Liquour upon the hot or boiling Water, and the Application of the lighted Candle or Paper may be performed at the ſame time; otherwiſe the Æther is immediately diſſipated, without any ſuch Effect. "There is "therefore need of an Aſſiſtant, or of both Hands, and alſo of "a Room where Entrance may readily be given to freſh Air, "proportionable to the Magnitude of the Flaſh of Lightning "which ſo rarifies the Air as to endanger the Stoppage of Reſpi-"ration. (*Succeeded.*)

4. Hence

4. Hence it appears, that this Æther is both Fire and a very fluid Water, but ſo volatile that it ſoon evaporates, and that it is the pureſt Fire ; inſomuch, that if kindled in a thouſand times the quantity of cold Water, it burns inextinguiſhably. Wherefore, if you take an earthen Veſſel of any magnitude, whoſe Mouth or Orifice may be one or two Yards wide, but the inferior Latitude of the Veſſel may contain 600 or 6000 Gallons of Water, the Experiment will be the ſame, pour on the top but one Ounce, or a ſmall Vial full of this Æther, and apply to it a lighted Wax-candle, it takes Fire immediately, burns placidly, and is ſo far from being extinguiſhed by the moſt profuſe Supereffuſion of common Water, that it much increaſes the Vehemence of the Flame, and laſts till the ſubtil Parts of the Æther are conſumed and ventilated by the Flame. This Experiment ſhould be made in a large and lofty Room, not in danger of taking Fire. *(Not ſhewed.)*

5. The Senſe of Touch does not manifeſt the leaſt Oilineſs or Fatneſs in this æthereal Liquor, notwithſtanding that it is the true, natural, and only Diſſolvent, or Menſtruum of all Fat, Oil, Roſin and Gum whatſoever : By means whereof all Sorts of Fat, and every kind of Fire or Flame is extricated by a ſpeedy, ſafe, and pleaſant Operation. On theſe Accounts it is that this æthereal Liquor will not unite with any kinds of Salts whatſoever, but all Sorts of Oils, Pitch, Turpentine, Opobalſams, Camphire, Wax, Ambergris, Sperma Ceti, Maſtich, Muſk, Copal, and the like, it diſſolves moſt readily, and with the greateſt Eaſe extracts their beſt Eſſences.

6. And indeed a wonderful Harmony is obſervable betwixt Gold and this Æther, even greater than between Gold and *Aqua Regia* ; inſomuch as from hence Gold appears to approach nearer to the Nature of Oils than of Earths, as ſhall be proved when we treat in their proper Place of the three harmonious Menſtrua which we have diſcovered, *viz.* The corroſive one for the Devoration or Diſſolution of Earths, Minerals, and Metals ; the aqueous one for the Diſſolution of all kinds of Salts ; and laſtly, the æthereal Liquor, or *Oleous Menſtruum.* If a piece of Gold be diſſolved in the beſt *Aq. Regia*, and upon the Solution, cold, be poured ℥ ſ. or what Quantity you pleaſe of the Æthereal Liquor, ſhake the Glaſs carefully, and all the Gold will paſs into the æthereal Liquor, and the *Aqua Regia*, robbed of all it's Gold, will preſently depoſite the Copper at the bottom of the Veſſel as a white Powder, which turning of a green Colour, contains the Portion of Copper wherewith the Gold was adulterated. The Æther will ſwim like Oil on the Surface of the corroſive Waters. The Experiment deſerves the utmoſt Attention ; for here the heavieſt of all Bodies, Gold, is attracted by this very light Æther, or (whereas the Air, which with a common Force preſſes alike all Bodies, is here excluded, and the

the Æther itſelf encompaſſes and touches the Surface of the Water) the Gold, by the Force of it's Gravity, as by an Impulſe, would deſcend from thence ; or laſtly, this Phænomenon is owing to a certain Harmony and Similitude of both of them. (*Succeeded.*)

7. Æther then is certainly the moſt noble, efficacious and uſeful Inſtrument in all Chymiſtry and Pharmacy, *Ubi enim ignis potentialis, ibi actuali non opus eſt*, inaſmuch as Eſſences and Eſſential Oils are extracted by it immediately, without ſo much as the Mediation of Fire, from Woods, Barks, Roots, Herbs, Flowers, Berries, Seeds, &c. from Animals, and their Parts too. Thus from Caſtor, by a certain Manufaction, may be prepared an Oil ſweeter than that of Cinnamon, and alſo the true Oil of Saffron, of wonderful Efficacy ; and all by this particular Encheiraſis, without the Help of Fire or Diſtillation. For an Example of our Method, take Mint, Sage, or Orange-peels, Cinnamon, &c. or all theſe together ; cut and bottle them ; pour upon them a Spoonful or two of the æthereal Liquor ; and after it has ſtood an hour in a cold Place, fill up the Bottle with cold Water, and you ſhall ſee the eſſential Oil, ſwimming upon the Water poured upon them, eaſily ſeparable by the Funnel, or *Inſtrumentum Tritorium*. Of this eſſential Oil, one Drop only upon a Lump of Sugar, manifeſts to the Taſte, &c. the medical Virtues of the Plant, exquiſitely drawn out, comprehended in this Eſſence, deſervedly named *COS*, as containing the Colour, Odour, and Sapor or Taſte of the Plant or Plants. In like manner the eſſential Oils of Exotics are eaſily prepared. (*Succeeded.* But it is not a true eſſential Oil, but an exceſſive ſtrong Tincture, which you may call the Eſſence.)

8. Of the like Uſe it is in the Animal Kingdom, where it produces an eſſential Oil of *Phoſphorus* ; as likewiſe in the Mineral Kingdom, though not ſo immediately, becauſe the Reſolution of Earths muſt proceed. Moreover, it is eaſily proved that the ſame Liquor extracts the pureſt Gold, or every Part of the golden Syſtem from any, or all the baſer Minerals, and that this Gold thus extricated, is by this one Operation better and ſooner purified than by Fuſion of Minerals with Antimony.

9. This our Water is neither corroſive nor joined with apparent Corroſives : Wherefore fill as many Bottles with æthereal Water as there are Sorts of Salts, and into the firſt, drop by drop diſtil Oil of Vitriol ; put into the ſecond, Spirit of Sea Salt ; into the third, Spirit of Nitre, or of Alum, or of Sal Ammoniac prepared with Water, or the Lixivium of Tartar, or rectified Wine-Vinegar, all the Salts immediately ſink to the bottom : Beſides, it is the lighteſt of all Liquors ; for fill any Veſſel with ℥ xx. of Oil of Vitriol, the ſame emptied, will contain but ℥ vii. of Æther. It is the very Ens, or Being, moſt pure of Flame ; where-

fore

fore neither Soot nor Aſhes are ever found upon it's Deflagration. *(Succeeded.)*

Thus far Dr Frobenius ; *but to make this Paper more than a mere Harangue, it is abſolutely neceſſary to ſubjoin two Paragraphs out of a Paper of that excellent Chymiſt Mr* Godfrey, *(Dr* Frobenius's *Fellow-Labourer) in theſe Experiments which he delivered in when this* Æther *was made public before us.*

" *Feb.* 19, 1729-30. That this Liquor *Æthereus*, was formerly " very much eſteemed and enquired into, doth clearly appear by " an Experiment I made formerly for my worthy Maſter, Eſq; " *Boyle*, by the Means of a metallic Solution, namely, by the So- " lution of crude Mercury united with the *Phlogiſton Vini*, or other " Vegetables, and this *Æther* ſwam on top of the Solution which " I ſeparated *per Tritorium. Note*, This is what I have done for- " merly in Eſq; *Boyle*'s Laboratory, and Sir *Iſaac Newton* was very " well acquainted with it too ; which by reaſon of Shortneſs of " Life was not brought to a full End, to do it ſo readily " in quantity. But when Dr *Frobenius*, by Experiments on this " in my Laboratory, did produce it in greater quantity, he " wanted to ſee how far Sir *Iſaac Newton* had gone on with it in " his Book. There we ſaw that great Man's Application in Fol. " 330, that he had done it *cum Ol. Vitr. & Sp. Vin.*

This of Sir Iſ. Newton, *is the* Sp. Vini Æthereus, *only there is a difference in the Proceſs : The Liquor* Æthereus *is made with equal Parts in Meaſure, not Weight. The upper yellow Liquor is ſeparated from the inardent ſulphureous* per Tritorium. *The inferior Liquor is thrown away ; and the ſuperior yellow is put into a Retort to be diſtilled with the moſt gentle Heat ; and the Extraction of the æthereal Liquid continued ſo far until the ſuperior Hemiſphere feels cold, and the Retort being clapped in the Hand, there is found in the Receiver a* Vino-ſulphureous Gas *very æthereal. Let the Sulphur be precipitated by adding an* Alkali, *and gently throwing it in till all Ebullition ceaſes, and the Liquor will not farther ſtrike itſelf againſt the Hand, but will ſtrangely attract it. Then the* Alkali *will go to the bottom of itſelf, or precipitate itſelf in the common Water.*

The Preparation of the Pruſſian *Blue, ſent from* Germany *to* John Woodward, *M. D. Prof. Med.* Greſh. *F. R. S.* No. 381. *p.* 15.

VIII. 1. ℞ Tartari crudi & Nitri crudi Siccati ad ℥iiii. pulveriſentur minutiſſime, & commiſceantur, deinde admoto igneo carbone detonentur, & habebis Salis Tartari extemporanei ℥iiii. Dum adhuc calidum eſt hoc Sal, pulveriſetur ſubtiliſſime, & addantur ſanguinis Bovini probe exſiccati & ſubtiliſſ. pulv. ℥iiii. Haec, bene mixta, indantur crucibulo, ut tertia pars vacua ſit ; impoſito dein operculo igni committatur, & circumdetur crucibulum carbonibus, ut ſenſim ardeſcat, & materia ſine praepropera accenſione flammam concipiat & igneſcat. In hoc ignis gradu teneatur materia, donec flamma & accenſio remittat ; augeatur demum ignis,

ut

ut valde candeat materia, & parum flammae è crucibulo amplius emineat. Remove demum ab igne crucibulum, & materiam mortario ingeſtam leviter contere, & ad manus habeto aquae ferventiſſimae pluvialis libras 4 ponderis civilis, cui materiam, adhuc ferventem, immittas, & per ſemihorae ſpatium coque; decoctum per linteum coletur, & materia remanens nigra, aquae portioni denuo affuſa, igni iterum apponatur, coquatur, & percoletur; id quod eouſque continuandum, donec ſalſedo & acrimonia omnis è materia ſit elixiviata, & aqua redeat inſipida. Humores omnes in linteo & materia reſiduos, fortiter exprime, & ubi ſingula in unum colligeris, igni iterum committe, & ad remanentiam 4 librarum evapora, & ulteriori uſui ſerva, ſub No. 1.

℞. Porro Vitrioli Anglici ad albedinem leviter calcinati ℥i. ſolvatur in Aquae pluvial: ℥vi. filtretur per chartam & ſignetur: No. 2.

℞. Denique Aluminis crudi ℥viij. ſolvatur in libris 4 aquae ferventiſſimae ad omnimodam Aluminis conſumptionem, hoc rite peracto, adjunge ſolutionem Vitrioli ſub No. 2. aſſervatam, quae ex igne fervens ingeratur ollae ſatis magnae & amplae, & cum lixivio No. 1. ſeorſim bene fervefacto, combinetur. Fiet ex continenti magna ebullitio, & apparebit color viridis montani ſeu chryſocollae; effundatur alternis vicibus, durante ebullitione, ex uno vaſe in aliud, qua ceſſante, quieti committe. Tum linteo inſinuetur, ut aquoſitas tranſeat, color vero in linteo remaneat; ſi igitur nihil humiditatis amplius diſtillet, cum ſpathula lignea è linteo in ollam novam minorem remove; ſuperfunde poſtea ſpiritus ſalis comm. ℥ij. vel ℥iij. & ſtatim apparebit color coeruleus pulcherrimus: quae probe mixta per noctem quieſcant, quo facto aquae pluvialis magna quantitas addatur, in gyrum moveatur ſpathula, & poſteaquam reſedit materia, aqua decantetur, & recens aqua ſuperfundatur, & eouſque labor reiteretur, donec omnis acrimonia ſit deſumpta, & aqua inſipida defluat; hoc pacto praecipitatum tuum ſummè coeruleum linteo expanſo ingere, ut aqua diſtillet, ſenſimque color calore leni exſiccetur uſui.

N. B. Calcinatio magni momenti eſt in hoc opere, nam color cyaneus & coeruleus obſcurus ortum ſuum trahit à calcinatione levi, mediocri, & forti ſanguinis arefacti cum ſale Tartari, & inde diverſitas coloris.

Lixivia ferventiſſima uno eodemque feſtinatiſſimo actu ſunt confudenda.

Obſervations and Experiments upon the foregoing Preparation; by Mr John Brown, *Chymiſt F. R. S.* N° 381. *p.* 17.

2. In going thro' the foregoing Proceſs exactly, according to the Proportions preſcribed; I obſerved that by a Calcination of ℥iiij. of Blood dried, with ℥iiij of *Sal Tartari*, in 2 Hours time that Part of the Operation was over, and a black ſpongy Subſtance remained in the Crucible weighing ℥iiij; a Diſſolution of which being

made in boiling Water and afterwards filtred, the Remainder, when dried, weighed ℥ ix. *Avoird.* the former having been weighed by the ſame kind of Weight. The Loſs and Filtration of the Vitriol and Alum, is not worth taking notice of, they having both been very clean before they were diſſolved. The Mixtures being made as preſcribed, with the Addition of the *Spiritus Salis*, the Product was a very fine Blue, which when well edulcorated by frequent Waſhings, and after that thoroughly dried, weighed ℥ i. or a little more, and entirely anſwered the Character the Author gave of it.

Among the ſeveral Experiments that were made with theſe Liquors, I mean the *Lixivium* with Blood, the Solution of Vitriol, the Solution of Alum, and the Spirit of Salt, tho' they always produced a Blue, yet that Blue differed in degrees of Colour, according to the varied Proportions of the Vitriol and Alum, and the Colours produced from theſe ſeveral Proportions were each of them improved by the Addition of the *Spiritus Salis.* I ſhall mention only two of the ſeveral I tried, in one of which the Alum was entirely left out, and a pale Blue produced; in the other, the Proportions of Vitriol and Alum were equal, and a very deep Blue was produced. Theſe Differences in Colour, ariſing from the ſeveral Proportions of the Vitriol and Alum, are only mentioned to confirm the Truth of the Author's Preſcript, as being the moſt exact and beſt proportioned to produce the fineſt Colour of any I have tried. The only Misfortune he takes notice of, as attending his Preſcript, is what may happen in the Calcination.

It would be curious to know what gave the firſt Hint for the Production of ſo fine a Colour, from a Combination of ſuch Materials; eſpecially when we come to conſider, that the Blood has the greateſt and principal Share in this ſurprizing Change. I doubt not but Blood, or Fleſh of any kind, would produce the ſame Effects, but have reaſon to believe the latter would not produce ſo beautiful a Colour as the former. I purpoſely dried ſome Beef freed from it's Skin and Salt, and purſued the ſame Courſe as with the Blood; but there was a ſenſible Difference to be obſerved during the Calcination, and a very manifeſt one in the Beauty of the two Colours, when finiſhed.

To prove the Share the Blood has in this Change, the following Experiments (ſome of which I ſhewed before this Society) may be convincive. The Solution of Alum mixed with that of the Vitriol produces no Alteration of Colour: If to theſe you add the *Spiritus Salis*, the Appearance is the ſame; but if to the whole you put the *Lixivium* with Blood, there precipitates a Blue. If you ſubſtitute, inſtead of the *Lixivium* with Blood, a *Lixivium* made with the ſame Salt of Tartar only, which then becomes an *Ol. Tartari*; and after

the Mixture of the Solution of the Alum, with that of the Vitriol, you pour on this *Ol. Tartari*, there follows indeed a Precipitation, but of no Colour; and if you add the Spirit of Salt, it ſo ſtrongly attracts what is precipitated, as to render the muddy Mixture perfectly clear. The very ſame Effect will follow, if any volatile alcalious Spirit is made uſe of as a Precipitant, or any volatile Salts diſſolved in Water; nor can the Blood itſelf be ſuppoſed to communicate this Change from any ſuch Properties, the Heat of Fire it undergoes in the Calcination, being ſufficient to throw them off.

In the Calcination of the dried Blood and Salt of Tartar it was obſerved, that there was a Loſs of juſt $\frac{1}{2}$. It is difficult to determine exactly what Quantity of either was loſt by this Calcination, but it will eaſily be granted, that there was loſt a far larger quantity of the Blood, than of the Salt of Tartar; and that is obvious from an Experiment, by which, when the Salt of Tartar was calcined by itſelf, with the ſame degree of Heat, it loſt leſs than $\frac{1}{8}$ Part, whereas, when the dried Blood was calcined by itſelf, it loſt more than $\frac{6}{8}$. The Blood, in Calcination with the Salt of Tartar, communicates it's tinging Quality to the Salt, or that Quality is extracted from it by the Salt, and paſſes with it in it's Diſſolution in the boiling Water. To prove this, ſome dried Blood was calcined by itſelf, and a ſtrong Decoction was made of it in Water, and afterwards filtred: This, when mixed with the former Solutions, produced little or no Alteration; but on the Addition of the *Spiritus Salis*, changed to an Amber Colour, without any Precipitation. When this Liquor was mixed with the *Ol. Tartari*, and poured to the former Solutions, it cauſed a Precipitation, but no Colour, and the *Spiritus Salis*, as in the other Experiment, made the Liquor clear again, but left this alſo of an Amber Colour. The Change of Colour is not effected in any of the Materials, except in that of the Solution of Vitriol, ſo that the Alum ſeems only to be of uſe in fixing the Colour, as it is often uſed by the Dyers for that Purpoſe, and the *Spiritus Salis* gives it a deeper Dye. For if the *Lixivium* with Blood be poured to the Solution of Alum alone, there will fall a Sediment a little on the Purple, to which if you add the *Spiritus Salis*, it changes the Colour, and the Sediment is of a Brown.

So, much the ſame Changes will be produced, if you pour the *Spiritus Salis* to the *Lixivium*, but not the leaſt Appearance of a Blue; whereas, when the *Lixivium* is poured to the Solution of Vitriol, there immediately follows the Blue, which is ſtill heightened by the Addition of the *Spiritus Salis*. It will not be improper to take notice, that as the Author orders all the Liquors, except the *Spiritus Salis*, to be boiling hot when mixed, ſo it is certain the Colour is thereby more immediately produced, and looks more beautiful; but moſt of the Experiments here mentioned were made with the

the Liquors cold, and the Colours came to their Beauty with a little waſhing. In one of the Experiments with the Liquors cold, after the *Lixivium* with Blood had precipitated the Blue in the Mixture of Alum and Vitriol, by pouring in a little more of the *Lixivium*, the Blue all diſappeared, and an ugly muddy Colour was left; but the Addition of the *Spiritus Salis* ſoon diſcharged that, and the Blue returned. In calcining the Beef and Salt of Tartar, I found the Matter left in the Crucible to weigh juſt ½ of the whole Mixture, as in that with the Blood; but after the boiling it in Water, the *Reſiduum* in the Filtre, when dried, was very near ⅓ leſs in proportion than the other. From whence may be reaſonably inferred, that the Salt of Tartar holds a larger Share of the Beef in the one Operation, than of the Blood in the other.

Having in the former Part of this Account of the *Pruſſian* Blue proved, by the Experiments there mentioned, that the Solution of Vitriol was the only Subject among thoſe Ingredients, that the *Lixivium* of Blood produced this Change of Colour in it; and having ſince conſidered that the Vitriol made uſe of in this Preparation, is no more than Iron diſſolved by a Liquor running from the *Pyrites*, when expoſed to the Weather, which is afterwards boiled up and ſhot into Cryſtals; it ſeemed to follow, as a natural Conſequence, that this Metal is the Subject on which the *Lixivium* of Blood produces the Change; and this Thought gave occaſion to the following Experiments on metallic Bodies, in order to obſerve if the ſame Change of Colour could be produced in any of them.

To a Solution of Silver in *Aquafortis* was poured the *Lixivium* of Blood, which occaſioned a *Coagulum* of a pure Fleſh Colour. The *Lixivium* made with Fleſh produced a whitiſh *Coagulum*, and the *Ol. Tartari* (which was continued to be uſed by way of compariſon with the other *Lixivia*) a much whiter. By the Addition of the *Spiritus Salis* to each of theſe, the Bloom of the Fleſh Colour was taken off in the firſt, but ſuffered no other Change. In the ſecond the *Coagulum* was a little tinged with Blue; and in the third the White was manifeſtly improved. The bluiſh Tinge in the ſecond of theſe Experiments cannot entirely be aſſigned as the Effect of the *Lixivium* with Fleſh, becauſe Silver, when thus diſſolved, whether precipated with ſalt Water, or *Ol. Tartari*, will, after it has ſtood ſome time, contract a bluiſh Tinge, and this from an Alloy of Copper, from which it is not entirely freed.

The ſame Liquors were made uſe of to precipitate the Mercury in the *Mercurius Sublimatus Corr.* diſſolved in Water; the Conſequence of which was, that the *Lixivium* with Blood produced a pure yellow; the *Lixivium* with Fleſh and Orange Colour; and the *Ol. Tartari* a dingy red. The Addition of the *Spiritus Salis* to theſe, made ſome very odd Alterations; for the firſt changed it's yellow

Colour for an Orange; the ſecond, it's Orange for a Blue; and the third became quite clear again without any Colour. The blue Colour in the Mixture of the *Lixivium* with Fleſh, and Solution of Sublimate, may be accounted for from the Vitriol in the Compoſition of the Sublimate; but it will not be ſo eaſy to give a Reaſon why the ſame Colour ſhould not have been produced from the *Lixivium* with Blood, and the ſame Solution.

Copper, when diſſolved in *Aquafortis*, tinges the Water of a green Colour; and if to this you pour the two *Lixivia* of Blood and Fleſh, the *Coagula* are much alike, *viz.* a white tinged with green; but when you add the *Spiritus Salis*, they both change and become of a Colour not unlike the Copper itſelf before it is diſſolved in the *Aquafortis*. If the *Ol. Tartari* be poured to a Solution of the Copper, the *Coagulum* is a pale green, which *Coagulum* the *Spiritus Salis* diſſolves, and leaves the Liquor clear, but green, as before Precipitation.

Tin-Glaſs (an imperfect Metal) diſſolved in *Aquafortis*, and mixed with the *Lixivium* of Blood made a milky *Coagulum*, and by the Addition of the *Spiritus Salis*, after ſome time ſtanding, it's upper Surface changed to a light Blue. The *Lixivium* of Fleſh and the *Ol. Tartari* produced both white *Coagula*, which the *Spiritus Salis* ſcarcely alters.

Lead diſſolved in Spirit of Vinegar produceth much the ſame white *Coagulum*, when mixed either with the *Lixivium* of Blood, Fleſh, or the *Ol. Tartari*, nor doth the *Spiritus Salis* make any Alteration.

By all theſe Experiments it is pretty evident, that not any of theſe metallic Bodies were affected by the *Lixivium* of Blood, ſo as to produce this fine Blue. The two Metals untried are Gold and Tin, the latter of which, when diſſolved in Spirit of Vinegar, has ſo near a Reſemblance to Lead diſſolved in the ſame *Menſtruum*, that in all Probability the Experiments would anſwer much alike in both. What may be expected from Gold, I am not yet ſo well aſſured of, as I am from Iron, which when diſſolved in *Spiritus Vitrioli*, will anſwer all the Experiments that have been tried with the Solutions of Vitriol, and produce as fine a Colour; nor can this be owing to any Property in the Diſſolvent itſelf, which, tho' drawn from the ſame kind of Vitriol all along made uſe of in theſe Experiments, yet is ſo altered by the violent Fire in the Production of it, as not to anſwer in any Trials to the Vitriol itſelf.

May we not therefore hence conclude, that Iron is the Metal, that is the Subject of this beautiful Colour produced by Means of the *Lixivium* with Blood?

IX. In §. I. The learned Author ſays, that many Years ago he drew, by ſimple Diſtillation, from crude Vegetables, a perfect volatile Salt; and that it is eaſily done from freſh Seeds of the hot antiſcorbutic Herbs, ſuch as Muſtard, Rocket, Onions, *&c.*

The End of the Third Part.

An Account of a Book, entituled, Adverſariorum Anatamico-Medico-Chirurgicorum Decas tertia. *Auctore* Fred. Ruyſch, *M. D. Anat. & Bot. Prof.* Amſtel. *R. S. S.* No. 379. p. 428.

THE

Philoſophical Tranſactions ABRIDGED.

PART IV.

CONTAINING THE

Philological and Miſcellaneous PAPERS.

CHAP. I.

PRINTING.

THE Advantage of Printing above Writing, has at laſt prevailed with the Grand Signor to permit a Printing-Preſs to be ſet up at *Conſtantinople*. It was obtained upon a Memorial preſented to him by the Grand Vizier, with the Conſent of the Mufti. The Privilege is granted to *Zaid* the Son of *Mehemet Effendi*, late Ambaſſador in *France*, and *Ibrahim Mutafarrica*, the Author of a ſmall Tract in this Book. The Licence extends to the printing all Sorts of Books written in the Oriental Lan-

A ſhort Account of a Book intitled, Tuhhfat ilkibar, *printed at* Conſtantinople, An. Dom. 1728. *By Mr.* John Eames, *F. R. S.* N°. 424. p. 338.

Languages, except ſuch as treat of the *Mahometan* Religion. The Book before me ſeems to be one of the firſt that ever was printed there. For though *Giauhauri*'s *Arabic* Dictionary, tranſlated into *Turkiſh*, was what the *Turks* deſigned, for particular Reaſons, to begin withal; yet the Manuſcript, from which they printed off the firſt Sheets, was found to be ſo incorrect, that the Grand Signor ordered the printing of it to be ſtopt, 'till a more correct Copy could be procured. During this Stop, the Book I am to give a brief Account of was printed, containing about 150 Leaves. The Language of it is not *Arabic*, as was ſuppoſed, but *Turkiſh*, though it has ſeveral Words and ſome Sentences that are ſo. The Title, or what may ſerve as ſuch, is *Tuhhfat ilkibar*, or, *A Preſent to the Great*; containing an Account of ſeveral Engagements at Sea. The Author is *Hagi Califa*, ſtiled *Chelebi Almurhhum*, *i. e.* A Gentleman who has obtained Mercy, or deceaſed. It conſiſts of two Tracts, a large, and a very ſmall one. The latter is done by the Publiſher, *Ibrahim Mutafarrica*, *Mutafarrica* is a Title of Honour ſignifying a Horſe-Soldier, obliged to go to the Wars when the Grand Signor goes in Perſon, but not elſe. It is a ſhort Account of Geographical Meaſures of Diſtances, *&c.* particularly of the Circumference of the Earth. The principal Treatiſe is partly Hiſtorical, and partly Geographical; the latter treats of the Nature of the Terreſtrial Globe, the Uſe of Maps, and Situation of Places, particularly of *Venice*, *Corfu*, *Albania*, *&c.* and ſuch as border upon the *Turkiſh* Dominions. The Hiſtorical Part is an Account of ſeveral Naval Expeditions and Battles between the *Turks* and *Chriſtians*, eſpecially during the Holy War, in the *Mediterranean* Sea, with their Conqueſt of the Iſlands and Places of Note upon the Sea-Coaſts. It is an Abridgement of the Hiſtory of their Admirals, from the taking of *Conſtantinople* to the Year 1653; gives a Deſcription of the Grand Signor's Arſenal at the *Porte*, with the Charges of maintaining it; and concludes with ſome Directions to the *Turkiſh* Officers. Beſides a general Map of the World, there are three others; one of the *Mediterranean*, or *White Sea*, as the *Turks* call it; another of the *Archipelago*, and the third of the *Venetian* Gulph: They have each Scales of *Turkiſh*, *French* and *Italian* Miles annexed; but what is ſomething ſurprizing theſe Maps have the Degrees of Latitude, but not of Longitude, marked upon the Sides. The laſt Plate has two Mariner's Compaſſes, the one containing the *Turkiſh* Names of the ſeveral Points; the other, beſides the *Turkiſh*, has the *Arabic* Names, which are taken from certain Stars ſuppoſed to riſe and ſet upon or near thoſe Points. The Book ends with Words to this Senſe: This Treatiſe was done by the Perſons employed in the Buſineſs of Printing, at the Printing-Houſe erected in the noble Month of *Dulkaadah*, in the Year 1141, (*i. e.* 1728.) in the good City of *Conſtantinople*. May God, *&c* I forgot

got to obſerve, it has the Imprimatur, or Commendations of a *Turkiſh* Divine, and three *Effendies*, prefixed; and at the End an Index of the *Errata*, with their Emendations in three Pages. The whole is done upon ſhining or gummed Paper, ſtamped with three Creſcents in Pale, and an Imperial Crown, proper to the *Turks*. I join with the learned Mr. *Clodius* (Author of a *Turkiſh* Lexicon and Grammar lately publiſhed at *Lipſic*) in wiſhing the *Turks* would print a compleat *Livy*, which Fame ſays is repoſited in the Grand Signor's Library in the *Turkiſh* Language, together with other *European* Books tranſlated into *Turkiſh*, whoſe Originals are not to be met with in *Europe*, a Catalogue of ſome of which is expected from the younger Monſ. *Fourmond*.

CHAP. II.

Chronology, History, Antiquities.

Remarks upon the Obſervations made upon a Chronological Index of Sir Isaac Newton, *tranſlated into* French *by the Obſervator, and publiſh'd at* Paris. *By Sir* I. Newton *P. R. S.* Nº. 389. p. 315.

I. 1. NOV. 11, 1725. A ſmall Tract in print was delivered to me, as a Preſent, from Mr. *William Cavelier*, Jun. a Bookſeller at *Paris*, a Perſon unknown to me, entituled, *Abregé de Chronologie de M. le Chevalier Newton, fait per lui même, & traduit ſur le Manuſcript Anglois.* And the Bookſeller hath premiſed an Advertiſement, in which he endeavoureth to defend himſelf for printing it without my Leave, ſaying, that he had writ three Letters to me for my Leave, and in the Third had told me, that he would take my Silence for a Conſent; and that he had alſo charged one of his Friends in *London* to ſpeak to me, and procure my expreſs Anſwer; and that having long expected my Anſwer, he thought that he might take my Silence for a Sort of Conſent, and ſo procured a Privilege, and printed it, and then received my Anſwer from his Friend, which was as follows.

I remember that I wrote a Chronological Index for a particular Friend on condition that it ſhould not be communicated. As I have not ſeen the Manuſcript which you have under my Name, I know not whether it be the ſame. That which I wrote was not at all done with Deſign to publiſh it. I intend not to meddle with that which hath been given you under my Name, nor to give my Conſent to the publiſhing of it,

I am,

London, May 27, 1725, *St. Vet.*

Your very humble Servant,

Isaac Newton.

The Privilege was granted *May* 21, and regiſtered *May* 25, Old Style, my Letter was dated *May* 27, and the Chronological Index, or Abridgement as he calls it, was printed before the Arrival of my Letter, and kept ever ſince to be publiſhed at a convenient Time. The Bookſeller knew that I had not ſeen the Tranſlation of the Abridgment, and without ſeeing it could not in reaſon give my Conſent to the Impreſſion. He knew that the Tranſlator was unknown to me, and was againſt me; and therefore he knew that it was not fit that I ſhould give my Conſent, nor be aſked to do it. He knew that the Tranſlator had written a Confutation of the Paper tranſlated, and that this Confutation under the Title of *Obſervations*, was to be printed at the End of it, and he told me nothing of all this, nor ſo much as the Name of the Obſervator, and

yet

yet ask'd my Consent to the publishing; as if any Man could be so foolish as to consent to the publishing of an unseen Translation of his Papers, made by an unknown Person, with a Confutation annexed, and unanswered at their first Appearance in Publick.

After the Recital of my Letter, he adds, that the Author of the Translation, and of the Observations upon it, pretends to have an entire Certainty that this Index, or Abridgment of Chronology, is the same with the Writing owned by me in my Letter, and is persuaded that the Manuscript, which hath been communicated to him, hath been copied from that of this Friend, that is, from that of the particular Friend above-mentioned in my Letter. And therefore the Manuscript, which hath been communicated to him, is that of *Abbè Conti*, a noble *Venetian* now at *Paris*. He, being about seven Years ago in *England*, gave me Notice, that the Friend above-mentioned desired to speak with me. And this Friend then desired a Copy of what I had written about Chronology. I replied that it was imperfect and confused, but in a few Days I could draw up an Abstract thereof, if it might be kept Secret. And some Time after I had done this, and presented it, this Friend desired that Signor *Conti* might have a Copy of it. He was the only Person who had a Copy, and he knew that it was a Secret, and that it was at the Desire of this Friend, and by my Leave, that he had a Copy, and he kept it secret, while he staid in *England*; and yet, without either this Friend's Leave or mine, he dispersed Copies of it in *France*, and got an Antiquary to translate it into *French*, and to confute it; and the Antiquary hath got a Printer to print a Translation and the Confutation; and the Printer hath endeavoured to get my Leave to print the Translation, without sending me a Copy thereof to be perused, or telling me the Name of the Translator, or letting me know that his Design was to print it with a Confutation unanswered and unknown to me.

The Translator near the End of his Observations (Page 90) saith, I believe that I have said enough concerning the *Epocha* of the *Argonauts*, and the Length of *Generations* to make People cautious about the rest. For these are the two Foundations of all this new System of Chronology. What he saith, concerning the *Epocha* of the *Argonauts*, is founded on the Supposition that I place the Equinox in the Time of the *Argonautic* Expedition, fifteen Degrees from the first Star of *Aries*, Pag. 75, 79. I place it in the Middle of the Constellation, and the Middle is not fifteen Degrees from the first Star of *Aries*. The Observator grants that the Constellations were formed by *Chiron* (Pag. 70, 71, 79.) and that the Solstices and Equinoxes were then in the Middle of the Constellations (Pag. 65, 69, 75.) and that *Eudoxus*, in his *Enoptron* or *Speculum* cited by *Hipparchus*, followed this Opinion, Pag. 62, 63, 65, 69, 79. And * *Hipparchus* names

* *See* Hipparchus *published by* Petavius, Vol. 3. Pag. 116, 117, 119, 120.

names the Stars, thro' which the Colures paſſed in this old Sphere, according to *Eudoxus*, and ſaith expreſly that *Eudoxus* drew one of theſe Colures thro' the Middle of *Cancer* and the Middle of *Capricorn*, and the other thro' the Middle of *Chelæ* and the Back of *Aries*. And the Colurus, paſſing thro' the Back of *Aries*, paſſes thro' the Middle of *Aries*, and is but eight Degrees from the firſt Star of *Aries*. I follow *Eudoxus*, and, by doing ſo, place the Equinoctial Colure about 7*gr*. 36′ from the firſt Star of *Aries*. But the Obſervator repreſents, that I place it fifteen Degrees from the firſt Star of *Aries*, and thence deduces that I ſhould have made the *Argonautic* Expedition 532 Years earlier than I do. Let him rectify his Miſtake, and the *Argonautic* Expedition will be where I place it.

As for the Length of *Generations*, the Obſervator ſaith, that I reckon them one with another at 18 or 20 Years a-piece (Pag. 52, 55.) which is another Miſtake. I agree with the Antients in reckoning three Generations, at about an hundred Years. But the Reigns of Kings I do not equal to Generations, as the antient *Greeks* and *Egyptians* did; but I reckon them only at about 18 or 20 Years a-piece one with another, when 10 or 12 Kings, or more, are taken in continual Succeſſion. So the firſt 24 Kings of *France* (*Pharamond*, &c.) reigned 458 Years, which is one with another 19 Years a-piece. The next 24 Kings of *France* (*Ludovicus Balbus*, &c.) reigned 451 Years, which is one with another 18 $\frac{3}{4}$ Years a-piece. The next 15 Kings (*Philippus Valeſius*, &c.) reigned 315 Years, which is one with another 21 Years a-piece. And all the 63 Kings of *France* reigned 1224 Years, which is 19 $\frac{1}{2}$ Years a Piece. And, if the long Reign of *Lewis* XIV. be added, the 64 Kings of *France* will reign but 20 Years a-piece. And they, that examine the Matter, will find it ſo in other Kingdoms: And I ſhorten the Duration of the antient Kingdoms of *Greece*, in the ſame Proportion that I ſhorten the Reigns of their Kings, and thereby place the *Argonautic* Expedition about 44 Years, and the taking of *Troy* about 76 Years after the Death of *Solomon*, and find *Seſoſtris* contemporary to *Seſac*.

So then the Obſervator hath miſtaken my Meaning, in the two main Arguments on which the whole is founded, and hath undertaken to tranſlate and confute a Paper which he did not underſtand, and been zealous to print it without my Conſent; though he thought it good for nothing, but to get himſelf a little Credit, by tranſlating it to be confuted, and confuting his own Tranſlation.

The Obſervator ſaith, that I ſuppoſe that the *Egyptians* began, about 900 Years before Chriſt, to form their Religion, and deify Men for their inventing of Arts, notwithſtanding that it appears by the Scriptures, that their Idolatry and Arts were as old as the Days of *Moſes* and *Jacob*, Pag. 82, 83. But he is again miſtaken. I deny not that the Kingdom of the lower *Egypt* called *Mizraim*, had a

Religion

Religion of their own, till they were invaded and subdued by the Shepherds, who were of another Religion: But I say, that, when the *Thebans* expelled the Shepherds, they set up the Worship of their own Kings and Princes. I say also, that Arts were brought into *Europe* principally by the *Phœnicians* and *Curetes*, in the Time of *Cadmus* and *David*, about 1041 Years before Christ; and do not deny that they were in *Phœnicia*, *Egypt*, and *Idumea*, before they came into *Europe*.

The Observator saith also, that 884 Years before Christ, I place the Beginning of the canicular Cycle of the *Egyptians* upon the vernal Equinox, although that Cycle never begins in Spring, Pag. 84, 85. But he is again mistaken. I meddle not with that Cycle, but speak of the *Egyptian* Year of 365 Days.

The Observator represents, that I have a great Work to come out: But I never told him so. When I lived at *Cambridge*, I used sometimes to refresh my self with History and Chronology for a While, when I was weary with other Studies: But I never told him, that I was preparing a Work of this Kind for the Press.

Abbè Conti came into *England* in Spring 1715, and while he staid in *England*, he pretended to be my Friend, but assisted Mr. *Leibnitz* in engaging me in new Disputes, and hath since acted in the same Manner in *France*. The Part he acted here may be understood by the Character given of him in the *Acta Eruditorum* for the Year 1721, Pag. 90. where the Editor, excusing himself from repeating some Disputes which had been published in those *Acta*, subjoins: *Suffecerit itaque annotasse Abbatem quendam Italum de Conti nobilem Venetum (de quo admiratione digna sibi præscripta esse ab Hermanno fatetur Leibnitius) cum ex Gallia in Angliam trajecisset, mediatoris vices in se suscipere voluisse, atque literas Newtoni ad Leibnitium deferri curasse, Leibnitianas cum Newtono communicasse.* And how Mr. *Leibnitz* by his Mediation, endeavoured to engage me, against my Will, in new Disputes, about occult Qualities, universal Gravity, the Sensorium of God, Space, Time, Vacuum, Atoms, the Perfection of the World, Supramundane Intelligence, and Mathematical Problems, is mentioned in the Preface to the second Edition of the *Commercium Epistolicum*. And what he hath been doing in *Italy*, may be understood by the Disputes raised there by one of his Friends, who denies many of my Optical Experiments, though they have been all tried in *France* with Success. But I hope that these Things, and the perpetual Motion, will be the last Efforts of this Kind.

2. There has been lately put into my Hands a Book published last Year at *Paris* by F. *Souciet*, Jesuit, against Sir *Isaac Newton's Chronology*, without waiting till the Book be published, and without knowing

Remarks upon some Dissertations lately publish'd at Paris, *by the Rev.* P. Souciet, *against Sir* Isaac Newton's *Chronology. By* Edmund Halley, *Astron. Royal, F. R. S.* N° 397. p. 205.

knowing the Contents thereof, otherwiſe than by a ſhort Extract, made at the Deſire of a very great Perſon, and without intention that it ſhould be publickly ſeen. However, a Copy thereof having been (as I ſuppoſe) ſurreptitiouſly obtained and carried over into *France*, the ſame was firſt tranſlated into *French*, and then printed at *Paris* with a pretended Refutation thereof by the ſame *P. Souciet*. Since then, Sir *Iſaac* having anſwered, as he thought, his Objections, has thereby given him a handle to publiſh five other Diſſertations againſt the new Syſtem of Chronology, as he calls it; the firſt and laſt of which, being chiefly Aſtronomical (ſince the great Author is no more) ſeem properly to fall under my Examination, both on account of the Poſt in which I have the honour to ſerve his Majeſty in quality of his Aſtronomer, as alſo from the long Acquaintance and Friendſhip that had ſubſiſted between the Deceaſed and my ſelf.

And firſt, I obſerve, that *P. Souciet* readily allows what ſeems to be the moſt exceptionable part of the whole Syſtem, *viz.* that *Chiron* the Centaur fix'd the Colures, in the ancient Sphere of fix'd Stars, in the ſame Places as *Hipparchus* tells us they had been ſuppoſed by *Eudoxus* many Centuries of Years after *Chiron*. His Words are theſe, ἐν δὲ τῷ ἑλέρῳ κολόρῳ φησὶ κεῖσθαι τὸ κήτος τὴν κεφαλήν, καὶ τὸ κριὸς τὰ νῶτα κατὰ πλάτος. This, undoubtedly, was the Poſition of the Colure of the Vernal Equinox many Ages before *Eudoxus*; but whether ſo old as *Chiron*, and the *Argonautick* Expedition, I ſhall not undertake at this time to enquire; but only obſerve, that *P. Souciet* in his *Faſtes du Monde*, or Abridgment of his Chronology, prefix'd to theſe Diſſertations, makes the *Argonautick* Expedition 1467 Years before our *Æra* of the Birth of Jeſus Chriſt, and the taking of *Troy* 1388 Years before it, which Date is 120 Years ſooner than the *Parian* Chronicle, read and publiſh'd by our Learned *Selden* in his *Marmora Arundeliana*, makes it; and above 500 Years earlier than the time aſſigned by Sir *Iſaac Newton*.

Now both of them making uſe of the ſame Premiſſes, it may ſeem ſtrange that their Concluſions ſhould be ſo widely diſtant: And indeed upon a Prepoſſeſſion that the *Argonautick* Expedition and the Siege of *Troy* could not have been leſs than 1000 Years before Chriſt, I muſt own, I was at firſt ſomewhat prejudiced in favour of *P. Souciet*, taking his Calculations for granted; and not having ſeen Sir *Iſaac*'s Work. But obſerving that he quotes Sir *Iſaac*, as ſaying, that in conſequence of what *Hipparchus* has recorded from *Eudoxus*, the Equinoctial Colure in the old Sphere was about 7° 36′ from the firſt Star of *Aries*, I was reſolved to examine the Matter with due Attention, eſpecially ſince the Good Father ſeems to triumph over his Adverſary, and to treat a Man of his Figure in the Common-wealth of Learning in a very ludicrous Manner, notwithſtanding the ſeveral fine things he ſays of him to palliate it.

I find

I find the Diſpute to be chiefly over what part of the Back of *Aries* the Colure paſt: The Words of *Hipparchus*, as from *Eudoxus*, are ſimply, that it paſt over the Back, without ſaying over what Star, or over what part of the Back it paſt. And the ſame *Hipparchus* ſhews, that if it paſt over the Star in the middle of the Back, it greatly differed from the Situation thereof in his Time; and conceiving thence that the Æquinoctial Points might have a regreſſive Motion, he was the firſt that attempted to define their Motion; but having no Obſervations older than thoſe of *Timocharis*, made within leſs than 200 Years of his own Time, and very coarſe withal, he was not able to determine the Quantity thereof, but gueſt it to be about a Degree in 100 Years; which, length of Time, and the more curious Obſervation of the Moderns, have now proved to be 1° 24′. or rather 50″ *per Annum*.

In a Word, Sir *Iſaac* takes the Colure to have paſt over the Middle of the Conſtellation of *Aries*, and very near the Star in the Middle of the Back (*v Bayero*). And *P. Souciet* will have it, that it paſt over the Middle of the Sign or *Dodecatemorion* of *Aries*, reckoning the Sign to begin with the firſt Star of the Conſtellation; and by Conſequence his Colure muſt paſs about midway between the Rump and firſt of the Tail of *Aries* (ε and δ *Bayero*;) which Situation could never be ſaid to be over the Back: But whilſt Sir *Iſaac* makes the Colure but 7° 36′ from the firſt Star of *Aries*, which *P. Souciet* makes 15 Degrees from it, the difference 7° 24′ at 50″ *per Annum*, makes 533 Years difference in the Reſult.

Let us now examine when the Stars in Queſtion did actually paſs under the Colure of the Vernal Æquinox, aſſuming their Places as they are in Mr. *Flamſteed*'s *Britiſh* Catalogue, fitted to the beginning of the Year 1690. He places the firſt Star of *Aries* in 28° 51′ of *Aries* with 7° 9′ North Latitude. And ſuppoſing the Obliquity of the Ecliptick 23° 29′, it will be as Radius to the Tangent of 23° 29′ : : ſo the Tangent of 7° 9′, to the Sine of 3° 7′ $\frac{1}{2}$, the difference of Longitude between the Star and the Point in the Ecliptick which paſt under the Colure, at the ſame Time with the Star; ſo that this Point was, *Anno* 1690 *ineunte*, in ♈ 25° 43′ 30″, and therefore allowing 50″ *per Annum*, the Star was under the Colure 1852 Years before the *Epocha* of the *Britiſh* Catalogue, that is, 162 Years before our *Æra* of the Nativity of Jeſus Chriſt; in which very Year *Hipparchus* began to obſerve the Æquinoxes recorded by *Ptolemy*, *Lib.* III. *Cap.* 2.

If therefore with Sir *Iſaac* we add 7° 36′ to the Long. of the firſt Star of *Aries*, as it was in 1690, we ſhall have 36° 27′, which the Colure moves in 2624 Years: And deducting 1690 therefrom, we ſhall have 934 Years before Chriſt for the *Argonautick* Expedition. And if to 7° 36′ we add 3° 7′ $\frac{1}{2}$ we ſhall have 10° 43′ $\frac{1}{2}$, that is, 772 Years before the firſt Star of *Aries* paſt the Colure.

Next let us inquire when the Star in the Middle of the Back of *Aries* (*ν Bayero*) paſt the Colure. Its Longitude *Anno* 1690 *ineunte*, was 9° 48′ 35″ of *Taurus*, with North Lat. 6° 8′; but by the foregoing Analogy, the Point in the Ecliptick over which the Colure paſt at the ſame Time with it, was 2° 40′ ½ before it, that is, in ♉ 7° 8′. Now 37° 8′ give 2674 Years nearly, or 984 Years before Chriſt, when that Star was under the Æquinoctial Colure, being but half a Century earlier than Sir *Iſaac* places the *Argonautick* Expedition; and ſhews that he took the Middle of *Aries* over which the Colure is ſuppoſed to have paſt, to be the Middle of the Conſtellation, and not of the *Dodecatemorion*, and in ſo doing, no doubt, had reaſon to place this Colure 7° 36′ in conſequence of the firſt Star of *Aries*, inſtead of 8° 17′, as it was when the Star in the Middle of the Back of *Aries* was under the Colure.

But if with *P. Souciet*, you make the Colure to interſect the Ecliptick 15 Degrees from the firſt Star of *Aries*, or 43° 51′ from the Æquinoctial Point, as it was *Anno* 1690, we ſhall have the time nearly 1470 Years before Chriſt; but then the Colure will be very far from the Middle of the Back of *Aries*, and leave only his Tail to the Eaſtward, as it leaves the Head of the Whale to the Weſtward, ſo as by no means to agree with the Deſcription we have of it from *Hipparchus*; which it were to be wiſh'd had been more definitive, and as well circumſtanced as what *Hipparchus* has left us of the Poſition of the Colures in his own Time, which upon Examination I find to be very conſiſtent, and the Obſervations made with ſufficient Care.

Thus I hope, I have ſhewn *P. Souciet*, that there was no Affectation of Myſtery in Sir *Iſaac*'s placing the Colure 7° 36′ from the firſt Star of *Aries*, nor any occaſion to drole as he does Pag. 131, 132. on that Account; as alſo that he ought to have deducted 3° 7′ ½ out of the 15 Degrees he aſſumes for the Diſtance of his Colure from the firſt Star of *Aries*, which will bring him 225 Years nearer to Sir *Iſaac Newton*'s Time. He is likewiſe entreated, in the next Edition of his Diſſertations to be a little more careful of his Numbers than he has been Pag. 134, 135, and to inform himſelf in the Sphericks, ſo as to give us the Right Aſcenſions of the Stars truly, from their given Longitudes and Latitudes.

Laſtly, I would inform him, that the Star in the Centaur which *Hipparchus* deſcribes, as being in his time very near the Autumnal Colure, was not Ψ of *Bayer*, but certainly Φ, and that, *anno ineunte* 1690, its Longitude was *Scorpio* 8° 43′ 40″, with South Latitude 27° 59′. But the Colure paſſing through that Star, by the Proportion given above, cuts the Ecliptick 13° 20′ 50″ in Antecedence of the Star, that is in *Libra* 25° 22′ 50″. But 25° 22′ 50″ give 1827 Years: Wherefore the Time this Star was in the Colure was 137 Years before Chriſt, when *Hipparchus* flouriſhed, and might very well obſerve it.

3. When

3. When I gave you my Paper of Remarks on *P. Souciet*'s Diſſertations againſt Sir *Iſaac Newton*'s Chronology, I was obliged to take what he was pleaſed to give us out of *Hipparchus*'s Comment on *Aratus*, not having then that Author himſelf by me. Since then, by the favour of a very good Friend, having gotten the *Florence* Edition of *Hipparchus*, *Anno* 1567, I find an Argument very much *ad Hominem*, which the R. P. muſt confeſs will bring the *Argonautick* Expedition full as low as Sir *Iſaac Newton* makes it. *Continued by the ſame.* N°. 399. p. 296.

P. Souciet in his fifth Diſſertation, Page 119, 120, finds out a Star of the firſt Magnitude, cloſe adjoining to that we now call *the firſt Star of Aries*, as it is in the Catalogue of *Ptolemy*, where it is ſaid to be in the *Horn of Aries*, and not in the *Ear*. This Star the R. P. ſuppoſes long ſince to have diſappeared; but that being of old very conſiderable, it was from this firſt Star of *Aries*, the Zodiack began, though for Argument-ſake he is contented to let it begin as Sir *Iſaac* does, with the aforeſaid Star in the Ear or Horn; which *Hipparchus*, in the laſt and 54th Page, tells us, in his time followed the Equinoctial Colure the 20th part of an Hour: And ſuppoſing the Star that has diſappeared, to have been at that time preciſely on the Colure, it muſt differ but 45 Minutes of Right Aſcenſion therefrom: But how he comes to make the difference of Longitude 40 Minutes no way appears, and is *gratis dictum*.

In Page 49 of the ſaid *Florence* Edition, *Hipparchus*, treating of the riſing and ſetting of the Conſtellations, tells us, that that of *Aries* began to riſe with 18 ½ Degrees of *Piſces* in the Ecliptick, and was wholly riſen with the 24th Degree of *Aries*, whilſt the Zodiack paſt the Meridian from 23 ½ Degrees of *Sagittary* to 14 Degrees of *Capricorn*: And again (Page 52) he ſays, that the Conſtellation of *Aries* began to ſet with the 29th Degree of *Piſces*, and was wholly ſet with the 26th Degree of *Aries*, whilſt the Zodiack paſt the Meridian from 29 Degrees of *Gemini* to 29 Degrees of *Cancer*. He tells us alſo that it was the very ſame Star that both roſe and ſet firſt in that Conſtellation, calling it ὁ ἐπὶ τῷ ἐμπροσθίῳ ποδός, Page 49: And again, Page 52 'tis named ὁ ἐν τοῖς ἐμπροσθίοις ποσίν, or *that in the Fore-feet* of the Ram.

This certainly is the Star P. *Souciet* would place on the Equinoctial Colure, and makes it long ſince to have diſappeared; without enquiring whether the aforeſaid *Data* were not abundantly ſufficient to determine its place in the Zodiack at that Time; and without regard to the odd uncouth Poſture he muſt ſuppoſe the Conſtellation of *Aries* to be in, when he makes one or both of the Fore-feet ſo near to, and above the Horn or Ear.

Hipparchus expreſly ſays, that it roſe when 23 ½ Degrees of *Sagittary* was on the Meridian, and ſet when 29 Degrees of *Gemini* paſt it; and take the Middle between thoſe Points, it is plain, that it

culminated with about 26 Degrees of *Pisces*, and that it had North Declination; the Excess above 180 Degrees shewing that the Ascensional Difference was about 2 $\frac{3}{4}$ Degrees. But to give the Argument its full Scope, the right Ascension of 23 $\frac{1}{2}$ of *Sagittary* (allowing *Hipparchus*'s Obliquity 23° 51′ 20″) will be found 262° 54′. And that of 29 Degrees of *Gemini* will be 88° 54′: So that this Star was above the Horizon (in the Latitude of 36 Degrees North; to which *Hipparchus* has adapted his Calculation) 12 Hours 24 Minutes or 186 Degrees; whence the Right Ascension of the Star is justly concluded 355 Degrees 54 Minutes; and its Ascensional Difference precisely 3 Degrees; which in that Latitude makes its Declination 4 Degrees 7 Minutes North. We have therefore gotten both the Right Ascension and Declination of this supposed first Star of *Aries*.

Let us now see what Longitude and Latitude results from the aforesaid Right Ascension with 4 Degrees 7 Minutes North Declination, assuming the Obliquity with *Hipparchus*, to have been 23° 51′ 20″; and we shall by a just Computation, find the Star at that time to have been in 27° 53′ of *Pisces*, with 5° 24′ North Latitude, which therefore was reckoned the Place of the Star at that time by *Hipparchus*. Add 2° 40′, for 265 Years between *Hipparchus* and *Ptolemy*, and we shall have its Place, in *Ptolemy*'s Account, *Aries* ☌° 33′, with 5° 24′ North Latitude. But the 22d Star of *Pisces* in *Ptolemy*'s Catalogue has the same Longitude and Latitude, with sufficient exactness, *viz. Aries* 0° 40′, with North Latitude 5° 20′, and is *Media trium in Lino Boreo Piscium* (*n Bayero.*) Hence it cannot be doubted but that this Star which *P. Souciet* takes to have been once a Star of the first Magnitude, was no other than the said 22d of *Pisces*, which in the *British* Catalogue, fitted to the Year 1690, is put down in *Aries* 22° 29′ $\frac{1}{3}$ with North Latitude 5° 21′.

How *Hipparchus* came to reckon this Star to be in the Fore-foot of *Aries*, does not at present appear; but it is not unlikely that these Commentaries of his upon *Aratus* were written some time before he set about making his Catalogue of the fixed Stars; when he might change his Opinion, and replace it in the *Line* of the *Fishes*, to which it seems more properly to belong.

Be that as it will, we will for once, suppose with *P. Souciet*, this Star to have been in the Beginning of the Zodiack, or of the Constellation of *Aries*, and that at the time of the first fixing the Colures, that of the Vernal Equinox past 15 Degrees in Consequence thereof. Now *anno ineunte* 1690, this Star being in *Aries* 22° 29′ $\frac{1}{3}$, if we add thereto 15 Degrees, we shall have *Taurus* 7° 29′ $\frac{1}{3}$, for the Point in the Ecliptick that was then the beginning of the Zodiack. Now 37 $\frac{1}{2}$ Degrees, at 50 Seconds *per Annum*, gives 2700 Years; from which deducting 1690, we shall have 1010 Years before Christ. But this Star having 5° 21′ North Latitude, the Colure,

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when it paſt over it, interſected the Ecliptick in 2° 20′ leſs Longitude, which gives the time 168 Years later, or but 842 Years before Chriſt. So that *malgré cette* grande *decouvérte*, the new Syſtem of Chronology is ſo far from being refuted, that it ſeems to be very much confirmed thereby, at leaſt in the Opinion of the R. *Pere*.

I have aſſumed the Latitude to which *Hipparchus* might have adapted his Calculations, to be 36 Degrees; becauſe I find in Page 14. of the aforeſaid Edition that he makes the longeſt Tropical Day 14 h. 30′: And in Page 29, he tells us, that the Southern Star in the left Foot of *Bootes* (*υ Bayero*) having 27° 20′ North Declination, was above the Horizon, 14 h. 57′; whence it follows, that the Latitude muſt be 36° 5′. He alſo tells us, in the ſame Page 29, that this Star ſet when 22° of *Capricorn* culminated, and 6° of *Taurus* aſcended; repeating the ſame thing in Page 39, which leaves no room to ſuſpect that thoſe Numbers are not the ſame that *Hipparchus* had computed. I therefore thought it worth while to enquire in what Latitude 6 Degrees of *Taurus* riſes when 22 Degrees of *Capricorn* is on the Meridian; and with the Obliquity of the Ecliptick, as now we have it, the Latitude reſulting is 35° ½ North; but with the Obliquity allowed by *Hipparchus*, it will be found leſs than 35°.

This I ſay, only to obviate any Objection that may be made by *P. Souciet* to the foregoing Argument; though if he pleaſes to examine it, he will find that an Error of a Degree in the aſſumed Latitude, will by no means invalidate the Proof here given that this *Firſt Star of Aries*, could be no other than the middle Star *in Lino Boreo Piſcium* marked *η* by *Bayer*.

II. The *Chineſe* Original from which the Tranſlation was made, is owing to the learned *Nien hi yao*, a *Tartar*, illuſtrious by Birth and Merit, and Viceroy of *Canton* in the Year 1724 ‖: For the *Tartars*, ſince their Conqueſt of *China*, are become well verſed in Sciences, and eſpecially in the Hiſtory of the Empire they conquered. Yet this Gentleman is not the Author of the Chronological Syſtem he has here drawn up. He himſelf tells us, he has taken it from the moſt valued hiſtorical Work in his Country †. What renders this Writer Praiſe-worthy, is his ranging his Syſtem in a beautiful

An Explanation of the new Chronological Table of the Chineſe Hiſtory, *tranſlated into* Latin *from the Original* Chineſe *, by Father* Joh. Franc. Foucquet, *Soc. Jeſ. Biſhop of* Eleutheropolis, *publiſhed at* Rome *in* 1730. *Collected from* 2 *Accounts thereof, written in* French, *one ſent from* Rome *by Sir* Tho. Dereham, *to the R. S. the other from F.* Foucquet *to F.* Euſtache Guillemeau, *a* Barnabite *at* Paris, *and by him tranſmitted to Sir* H. Sloane. N° 415. p. 397.

* *One of the Original* Chineſe *Tables printed at* Canton, *was preſented to the Society by Sir* Tho. Dereham, *and is now repoſited in their Library.*

‖ *His Father poſſeſſed the like Poſt, and in the Year* 1722, *his Brother was* Tſong Tou *of two Provinces, a more conſiderable and more important Employ than that of Viceroy.*

† China *is now the Country of theſe* Tartars *who were born there ſince the Conqueſt, that is about ninety Years ſince.*

tiful Order, which gives an extream Facility of ſeeing at firſt Sight the Series of the Dynaſties, or Imperial Houſes, the Names and Succeſſion of the Emperors, the Beginning, End and Duration of each of their Reigns. However, this is not the only Advantage of this new Table: The ancient Chronology of *China* is therein reduced to its true Beginnings. The moſt remote Epoque of this Chronology, according to this Author, does not ſurpaſs the firſt Year of a Prince called *Guei lie wang*, who began his Reign 424 Years before the vulgar Æra. Some there are, who think this Epoque might ſtill be brought nearer to us; not to fix there the Origin of the Nation, which, for ſtrong Reaſons, may be traced back to Time near the Deluge; but becauſe from much later Date only, doth any Certainty appear, of whatever is pretended to have befaln this famous People. * *Se ma quang* and *Tchu hi*, the two graveſt Hiſtorians *China* has produced, were of this Opinion. The firſt flouriſhed in the Year of Chriſt 1061 †; the ſecond about the End of the twelfth Century ‖. They have both omitted whatever is before the Time of *Guei lie wang*, nor would they mention ought of it in their Hiſtories: Nay, they have not begun them till the 23d Year of *Guei lie wang*, ſomewhat later than *Nien hi yao*, who begins with the firſt of this Prince's Reign. It is on the Example and Authority of theſe two illuſtrious Philoſophers that *Nien hi yao* has relied in ſuppreſſing what precedes. By fixing this Epoque at *Guei lie wang*, fabulous Times, and a thouſand Errors and Abſurdities current in *Europe* concerning three Imperial (abſolutely imaginary) Families, and Reigns anterior to, but no leſs chimerical than theſe Families, are retrenched. Theſe Errors will ſoon vaniſh of their own accord; ſo that the Subject of ſo much laborious, but uſeleſs Lucubration and Study, will at length ceaſe: a worthy Motive for congratulating the learned World.

This is not all; we are ſtill particularly obliged to the ingenious *Tartar*, for having found Means to place in his Table the Cycle of 60 Years, called *Kia Tſe*, ſo much eſteemed by the *Chineſe*, that it is as the Foundation of their whole Chronology: a Point which requires Explanation. As we mark the Incidents of ancient Hiſtory by the Years of the Olympiads, ſo the *Chineſe* mark what has happened in their Country by the Years of this Revolution. According to the *Chineſe*, the Prince under whom the great Wall was finiſhed, began his Reign the 52d Year of a Cycle, which is found to be the 4th in this chronological Table, reckoning from the Cycle of the general Epoque incluſively. This general Epoque, is the firſt Year of *Guei lei wang*. Every Year of the *Chineſe* Cycle is marked by two Letters, which make up its proper Character, and diſtinguiſh it from the other 59. Thus the firſt Year is called (1) *Kia Tſe*, and gives its

* Se ma wen, *or* Sema wen Kong. † Sœculo 11° vel 12°. ‖ Sœculo 13°.

its Name to the whole Cycle. Thus the 52d Year of the 4th Cycle, in which the Prince, who finiſhed the great Wall, began his Reign, is called (2) *y mao.* This Prince, after bloody Wars, became Monarch of *China*; and then abandoning himſelf to ſuch impious Pride, as the Philoſophers reproached him with, cauſed himſelf to be called (3) *Chi hoang Ti*, that is, *the firſt Maſter, the firſt Emperor reigning of himſelf*; for this is the real Signification of theſe Characters well analyſed; and thoſe glorious Titles belong to God alone in the ancient Monuments. This unheard of Uſurpation happened in the 26th Year of his Reign, which is the 17th of the 5th Cycle, and is there called (4) *Keng Chin.* It is thus that all the Years of the Emperors, for above 2000 Years, have Names in Hiſtory common to them with the correſponding Years of the Cycle: And theſe Names common to both, are a Sort of Link which unites the Years of the Emperors to the Cycle, and thereby prevents Confuſion. Hence we ſee how the Cycle among the *Chineſe* is the Baſis of all their Chronology.

Here a Queſtion naturally ariſes, concerning the Signification of theſe Characteriſtics, which diſtinguiſh the Years of the Cycle and Emperors: It is to be wiſhed it were as eaſy to anſwer this Queſtion as it is natural to propoſe it: But it regards Characters ſo infinitely different from ours, that their Nature or Origin have never been well extricated, nor has there been any Principle hitherto eſtabliſhed for their Explanation. We muſt remark, 1. That it is not poſſible to give theſe Names any Tranſlation. 2. That theſe Names are compoſed of 2 Sorts of Characters * very famous among the *Chineſe*, who get them by Heart in their Youth, and employ them on a thouſand Occaſions. Theſe of the firſt Sort are ten in Number, and are called the *Year-Letters*; theſe of the ſecond, twelve, and are named *Hour-Letters*. 3. That theſe two Sorts of Characters are combined, by repeating the ten *Year-Letters* ſix times, and the twelve *Hour-Letters* but five times; and from this Combination reſult 60 Names for the Years that compoſe the Cycle. Theſe three Points well comprehended ſuffice for the Uſe and Underſtanding of the chronological Table.

The *Chineſe* pretend that theſe 22 Letters were invented by a very ancient King, whom they name (5) *Hoang Ti*, in order to determine the Beginning, Progreſs, End, and ſucceſſive Periods of a great Year; for they have one which includes a certain Number of Ages, though its total Duration be no where diſtinctly marked. They ſay the great Year is ſucceſſively at *Kia*, at *y*, and at *Ping*. Now it is no eaſy Matter to determine the Extent of theſe different Parts of the great Period (for there is room to conjecture that they are unequal) how long, for Example, laſts that which commences at (6) *Kia*, that at (7) *y*, and ſo of the reſt; nay, it is perhaps impoſſible, for want of certain Principles, the Knowledge of which is entirely loſt.

When

* *See the Characters in the Plate.*

When the Year was at *Kia*, which ſeems to ſignify when it began, this Point of Time, according to Tradition, is called (8) *O fong*; when it was at *y*, this is called (9) *Tcheou Mong*; when at (10) *Ping*, the Name given to it was (11) *Jeou Tchao*. Every one of the other 19 Letters has in this manner a Word for its Device; but as it is plain, that all theſe Words are very ſtrange to *European* Ears, and that thoſe which remain are as obſcure and barbarous as *Kia Tſe*, *Y mao*, *Keng chin*, it is beſt to omit mentioning them. Nevertheleſs one ſhould not eaſily believe that theſe Words are void of all Meaning, or that the Letters, whoſe Names they are, are Figures made at Hazard, or arbitrarily imagined. The Inventor of theſe Names muſt have propoſed to himſelf ſome End. It is already known in general, and is demonſtrated, elſewhere, that the Characters preſerved by the *Chineſe*, but much more ancient than them, are true Hieroglyphicks. It is likewiſe known, and ſtrongly demonſtrated, that the Doctrine veiled under the Appearance of theſe Hieroglyphicks, is very myſterious and ſublime: And it is unreaſonable to regard as Nonſenſe, and reject ſuch as we underſtand not, purely becauſe we do not underſtand them. And indeed when we cloſely examine the 22 Letters in Queſtion, we perceive in ſeveral of them ſomewhat very myſterious, with which the *Chineſe* themſelves preſent us, without underſtanding them, For Example, (12) *Tſe*, the firſt of the *Hour-Letters*, ſignifies with the *Chineſe* both the Moment of Midnight and a tender Babe juſt born (wrapt up in his ſwadling Cloaths.) *Ou*, the 7th of the *Hour-Letters*, ſignifies the Moment of Noon, and a Man lifted on a Croſs. This Letter ſignifies Noon, according to the Primitive Meaning, which ſtill ſubſiſts without ever having been diſuſed. It alſo ſignifies a Man lifted on a Croſs, as is evident to the Eye of any Perſon, who has the firſt Tincture of the Characters. I know ſome Difficulty may be raiſed on this Point, but it ſhall be reſolved in its proper Place. Where have this People got ſuch Ideas? They are incomprehenſible to them at preſent, and yet (it is ſtrange) they preſerve them preciouſly, and uſe their utmoſt Endeavours to find out the Senſe of them, but to no Purpoſe. It will encreaſe the Surpriſe to reflect on a *Chineſe* Axiom, the Senſe whereof is, that the Heavens opened at the Hour of *Tſe*, which according to the foregoing Expoſition, ought to be underſtood of the Moment of Midnight. And in order to raiſe the Admiration a Degree higher, *Tſe*, which ſignifies an Infant, is literally and properly uſed to ſignify *Son*. Now let the Reader give Attention to the ſurpriſing Words of a *Chineſe* Writer on this Son. "(13) The firſt "Inſtant, ſays he, of the Production of Things, their Principle "and Origin came from the Son. The Son is the Cauſe by which "all Things had a Beginning." When the Year is at (12) *Tſe*, that is called (14) *Kouen Tun*. This *Kouen*, in the common Acceptation, ſignifies Work, Pain, Grief. *Tun* ſignifies being reduced

to

to great Anguiſh. The Application of theſe Words to the tender Babe, to the Son lately born, produces a Meaning, which by being too intelligible and too beautiful, raiſes Wonder. When the Year is at *Ou*, it is called (15) *Tun Tſang*. We have ſeen that *Tun* ſignifies Anguiſh, Affliction. To have the true Signification of *Tſang*, Recourſe muſt be had to the Analyſis, as on infinite other Occaſions. The Analyſis gives (16) *Yang*, the Emblem of a Lamb, and (17) *Tſang*, which ſignifies to divide, to pierce. Thus at the Hour of Noon, marked by (18) *ou*, that is, a Man on a Croſs, the Lamb was pierced. This ſo uſeful Cycle, which in the printed Hiſtory is a certain Rule to fix Time, the ingenious *Tartar* has diſpoſed in his Table with ſuch Art as renders the Relation of the Years of the Cycle to the Years of the Emperors very ſenſible; whence ſpring great Advantages that are very viſible to whoever attentively conſiders the Table, and penetrates into its Arrangement. In the Front of the Table appears a Line writ in Capital Letters, which extends Horizontally from Right to Left: This Line contains, according to the Order of their Succeſſion, the Names of 21 Dynaſties, or Imperial Families, who have reigned ſince four Centuries before *Jeſus Chriſt* unto this Time. Theſe Names placed exactly on the Lines, where are the Beginnings of the Dynaſties to which they belong, are as ſure Guides for eaſily finding them, and under the Direction whereof one comes without Difficulty to the Knowledge of the Emperors of theſe Imperial Families, as well as the Incidents of their Reigns. This Cycle is placed in the Middle, in a perpendicular Line or Column, which extends from the Top to the Bottom of the Table, and is divided into 60 little Lodges or ſquare *Area*'s, every one of which anſwers a Year of the Cycle, and contains the Name of the Year it anſwers. The Angles, or empty Spaces which ſurround the Name in each of theſe Lodges, were coloured black, that the whole may the more readily ſtrike the Reader's Eye, and be the more eaſily diſtinguiſhed. On the Right and Left of the Cycle thus placed are ranged 20 other Columns, divided into 60 Lodges each, in the ſame manner as the Cycle; and conſequently equal to the Cycle to which they are parallel. It is in the Lodges of theſe Columns parallel to the Cycle, that the Years of the Emperors are diſpoſed in their natural Order for above 2000 Years. They are diſpoſed from Top to Bottom, from the Right to the Left, after the *Chineſe* Cuſtom; but to avoid Miſtake, I mean the Right and Left to the Perſon who reads the Table. And it is eſſential to remark, that the Arrangement is ſuch, that each of theſe Imperial Years referred to the Column of the Cycle by a horizontal Line which falls at right Angles on this Column, anſwers the Year of the ſame Cycle, whoſe Name it bears in Hiſtory *. Purſuant to this Explanation, the firſt Year of the Prince named *Guei lie wang*, at which begins the Table, whereof that is the Epoque, will be found in the firſt Column at the right Hand,

* *The blank Columns at the End are left to put down the future Emperors as they ſhall ſucceed.*

pretty near the Bottom, under the Author's ſmall Preface; and oppoſite to the 53d Year of the Cycle called (19) *Pin chin*; becauſe in Hiſtory this firſt Year of *Guei lie wang* has the two Letters *Ping chin* for its Characteriſtick. The Reaſon why this firſt Year of *Guei lie wang* is taken for the general Epoque of the whole Table, is, becauſe there is neither Clearneſs nor Certainty in the Hiſtory before it: But if, becauſe this firſt Year of *Guei lie wang* is taken for an Epoque, it were placed oppoſite to the firſt Year of the Cycle, it would occaſion an Anachroniſm of 53 Years. A capital Point, to which thoſe, who intend to uſe this chronological Table, cannot give too much Attention. In a Word, ſince Hiſtory has given this firſt Year of *Guei lie wang* the Name of *Pin chin*, it is not allowed to give it any other in the Table; and one is obliged to refer it therein to the Year of the Cycle that bears that Name, to avoid confounding Time, and puzzling Chronology. It is in this Arrangement that all the Artifice of this new Table conſiſts. And this Point once well underſtood, is a Key which gives Entrance into all the reſt.

The Characteriſtick Names of the 60 Years which compoſe the Cycle, do by their Connection with the Years of the Emperors determine the preciſe Time of Incidents. Hence ariſes Clearneſs and Certainty in the *Chineſe* Chronology; for theſe Characteriſticks contribute to the Diſcovery of Errors, which either the Ignorance and Neglect of Copyiſts and Printers, or the Want of Attention in Authors, often introduce into Chronology. For Example: In the chronological Table of the *Chineſe* Monarchy, printed at the End of the Work, whoſe Title is, *Confucius Sinarum Philoſophus*, it is ſaid, that *Chi hoang Ti* *, in the 24th Year of his Reign, built, or (to ſpeak more accurately) finiſhed the great Wall; and conſequently the burning of the Books is placed in the ſame Emperor's 25th Year. Now according to Hiſtory, the great Wall was finiſhed in the Year of the Cycle called (20) *Ting hai*, a Name that can agree only with the 33d Year of this Emperor's Reign. As to the burning of the Books, it is marked in Hiſtory in the Year (21) *Vou Tſe*, which neceſſarily anſwers the 34th Year of this evil Prince.

Thus theſe Characteriſtic Names of the Years that compoſe the Cycle, are as a Touch-ſtone, that is of wonderful Service for diſtinguiſhing Truth from Falſehood, and re-eſtabliſhing Order when diſturbed. This Cycle removed, the Years of Emperors might be very eaſily confounded, by augmenting or diminiſhing their Number. When an Emperor is newly come to the Throne, if the firſt Year of his Reign be reck-

* Vide Monarchiæ Sinicæ tabulam chronologicam, p. 24, & 25. Chi hoang Ti, anno Imperii 24° murum celeberrimum 400 & ultra leucarum extruxit contra Tartarorum eruptiones: anno 25° libros omnes præter medicos & judiciarios cremari juſſit. (Chi *ſhould be pronounced like our* Engliſh She.)

reckoned that, wherein his Predeceſſor died, it is placing two Years in one; becauſe according to the *Chineſe* Cuſtom the Year, wherein an Emperor ends his Reign, is wholly attributed to him, though he died in the Beginning of the firſt Month; and his Succeſſor is held to reign only from the Beginning of the enſuing Year. Yet this Cuſtom, tho' very common, is not ſo univerſal, but that ſome Emperors have derogated from it. The *Tartarian* Emperor *Tchang hoang Ti*, Founder of the Dynaſty now reigning, cauſed the Year, wherein *Hoai Tſong* had murdered himſelf, to be taken for the firſt Year of his Reign, which was the ſeventeenth and laſt of this laſt Emperor of the *Mings*. If, according to Cuſtom, this 17th and laſt Year of *Hoai Tſong* were diſtinguiſhed from the firſt of *Tchang hoang Ti*, it would be making two Years of one, which would confound Time. Reſume the Cycle, apply it to the Years of the Emperors, and theſe Errors will appear of themſelves. You will ſee that the Year wherein *Hoai Tſong* died was called (22) *Kia Chin*; that that, wherein *Tchang hoang Ti* began his Reign, was likewiſe called *Kia Chin*: therefore they are the ſame Year. If it were made two, the Miſtake would be found at firſt Sight, and ſhould be corrected.

Under the (23) *Yven* thoſe occidental *Tartars*, whoſe Domination over *China* began in the Year 1280, and ended in 1368, the Emperor *Wen Tſong* died in 1333: *Ning Tſong* his Succeſſor reigned but ſome few Months, and *Chun Ti*, who ſucceeded *Ning Tſong*, mounted the Throne towards the End of the ſame Year. Three Years may be eaſily made of this one, in order to place the three Princes juſt named. But whoever makes uſe of the Cycle need not fear the Miſtake. The Deaths of the two firſt Emperors, and the Acceſſion of the third to the Throne, are three Incidents, which Hiſtory refers to the Year of the Cycle named (24) *Quei yeou*. And this Characteriſtic Name is a Link that binds them all together, ſo that it is no longer poſſible to ſeparate them.

Another Property of this new Table, no leſs remarkable or uſeful than the foregoing is, that it lays before the Eye all the Names of the particular Epoques aſſumed by the Emperors of *China* for near 2000 Years. For *Han uou Ti*, the firſt who took this ſort of Epoque, began his Reign 140 Years before *Jeſus Chriſt*.

No body, to the beſt of our Knowledge, has given *Europe* a ſufficient Account of the Nature of theſe Epoques, though they are very well worth explaining. The Emperors of *China* have a particular Cuſtom, little known in *Europe*, which, if Care be not taken, would infallibly ſpread Darkneſs and Confuſion over Chronology and Hiſtory. It is not allowed to pronounce the proper Name of any Emperor during his Life, which is looked on in ſome Meaſure as ineffable. This Reſpect continues even after their Deaths; for then it is not by their proper Names they are mentioned, but are conſecrated (if we may uſe the Term) by a Surname, which is a ſort of Character of

Canonization. And under this Title are they received into the Burying-place of their Anceſtors, and afterwards ranked in Hiſtory. But in their Life-time, to ſupply the Name that dare not be pronounced, they themſelves, in Imitation of *Han uou Ti* already mentioned, chooſe and determine a Term that ſerves for an Epoque to the Incidents of their Reign. This Term we call Epoque, becauſe it is from it the Years of Emperors are reckoned, and to it is referred every thing that falls out during theſe Years. Examples will make theſe Things eaſy to comprehend. The famous Emperor who died *Dec.* 20, 1722, after a Reign of 61 Years, had the Letter (25) *Hiuen* for his proper Name. During his Reign, this Letter was not to be put into any publick Memorial, Book or Writing. The Letter (23) *Yuen* was ſubſtituted in its Room, becauſe it would be a kind of Prophanation to employ for common Uſe the Name of a Prince, who ſtiled himſelf (25) *Son of Heaven.* After his Death his 4th Son, who ſucceeded him, gave him for Title of Canonization, the glorious Surname of (27) *Ching Tſou gin hoang Ti*; as much as to ſay, *the holy Anceſtor, the auguſt, good and merciful Emperor* *. It is under this Surname that he has been interred among his Anceſtors, and it is under the ſame that Hiſtory will make mention of him for the future. Upon his aſcending the Throne after a Father who had conquered *China*, he aſſumed for the Epoque of his Years the two Letters *Kang hi*, the Senſe whereof is *Solid Peace*, or *laſting and glorious Tranquillity.* Thus becauſe in the † 38th Year of his Reign he conquered by his Generals a Prince of *Tartary* named *Kaldan*, this Victory is ſaid to be gained the 38th Year of *Kang hi*, or of *the laſting and glorious Tranquillity.*

The Letters (28) *Yn Tchin* compoſe the Name of his 4th Son, who now reigns; wherefore the Uſe of theſe Letters is and will be prohibited until a new Government. As to the Title of Canonization, by which this Prince is to be recorded in Hiſtory, it will not be given him till after his Death. But upon his Acceſſion to the Crown, as he had a great Number of Brothers and Nephews, he took for Epoque of his Years the two Letters (29) *Yong Tching*, which ſignifie *Direct Concord*; to give to underſtand, that if his Brothers and Nephews pay him the Reſpect and Submiſſion they owe him, he would treat them with Kindneſs. The Empreſs his Mother died ſome few Months after he began his Reign; ſo the Death of this Princeſs will be marked in Hiſtory in the firſt Year of *Yong Tching*, or of the *Direct Concord.* Thus will all other Incidents be fixed by the

* *This Character* Gin, *which I have tranſlated* gracious and merciful, *ſignifies* Charity: *It alſo expreſſes ſometimes* the Conjunction of all Virtues: *And it may bear that Senſe here.*

The Character Hoang (27 *) *when analyſed, is found to be compoſed of* Tſe, *which ſignifies* of himſelf, *and* Wang, *which tranſlated is* Reigning.

† *In the thirty-fifth.*

the Years of the *Direct Concord* in which they will happen. It is plain from theſe Examples, that the Names of Emperors, and the Names of their Epoques are eſſentially different, and that thoſe of the Epoques comprehend very inſtructive Meanings, the underſtanding which muſt be of great Service to the clearing up of Hiſtory. But there is great Danger leſt the Name of an Epoque be made the Name of an Emperor, which would double the Number of Emperors, ſuppoſing even that each of them had taken but one Epoque during his Reign. No *European* Writer, that we know, has faithfully given them all: But this Table preſents us with an exact and entire Series of them. And yet it is a thing much to be wiſhed for, to have a faithful Explanation of them; a Work which would engage one in a Review of the whole Hiſtory, but will be undertaken nevertheleſs, if we find room to hope, that it will not be diſagreeable to the Learned. The Inconveniency is, that a great Number of Emperors have often changed theſe Names of Epoques. This Inconveniency is not found in the Dynaſty now reigning; but in the more ancient it is a very common Diſorder. *Han uou Ti*, who firſt introduced the Uſe of Epoques, aſſumed, during his 54 Years Reign, to the Number of 11 very different Epoques. Several others have followed his Example, which cannot but cauſe a great deal of Confuſion in Hiſtory, if one happened to imagine, as it is natural enough to do, that theſe Names of Epoques are the Names of ſo many Emperors. It was of Importance to clear up theſe Things thoroughly; this the Table does: And to avoid Miſtake, Care has been taken to have the Emperors Names or Titles engraved in large Characters, and thoſe of the Epoques in ſmall Letters. Moreover, when an Emperor, not content with one Epoque, has taken ſeveral, Notice is given of it by a Star placed on one Side of the firſt.

In ſhort, to leave nothing conjectural, as often as a Reader conſidering this Table, ſhall find two ſeparate Ranks of Figures oppoſite to one another in a Series of ſeveral Lodges, denoting different Numbers, he is to remember, that theſe Figures mark the Years of Emperors of two Families, which diſpute the Empire, one of which being ſoon to periſh, will give room to the other to aſcend the Throne. The Column found under the Title *San Koue*, that is to ſay, *the three Kingdoms*, is an Example hereof. This Title of three Kingdoms denotes the Time when *China* was divided into three different Parts; and the Column, on the Top of which is found that Title, in the Order of the Dynaſties is the twelfth, reckoning from the firſt at the Reader's right Hand incluſively. We ſee in the 43d Lodge that the firſt Year of the Epoque *Tai ho* aſſumed by the Emperor *Ming Ti*, of the Family called *Guei*, anſwers to the fifth Year of the Epoque *Kien hing* aſſumed by *Heou Tchu*, Emperor of the *Han's*: The ſecond Year of the Epoque *Tai ho* anſwers to the ſixth of the Epoque *Kien hing*, and ſo of the reſt that follow. The Reaſon is, that the Empire

pire was at that Time torn in Pieces by bloody Wars: The *Guei*'s were getting the upper Hand, and the *Han*'s very near their Ruin.

As to a great Number of Lodges that have but one or two Figures, without any Account of Hiſtory, they are unpleaſing Blanks, which however the *Chineſe* matter not, ſatisfied to have an exact Series of their Emperors Years in theſe Lodges. But ſuch Blanks may be filled by inſerting ſome conſiderable Incidents of Hiſtory, as ſome few have already been in the *Latin* Edition, *viz.* the building of the great Wall, the burning of the Books, the *Chriſtian* Æra, the Introduction of the Chriſtian Religion into *China*, the Appearance of a Star ſeen in the Heavens upwards of 70 Days *, the true Year in which our Saviour was born, *&c.* If this Addition pleaſe the Learned, it will be no difficult Matter to add ſeveral other Incidents unknown in *Europe*.

The principal Advantage of this Table is, that conformably with the moſt valued Hiſtory, it fixes the true Epoque of the *Chineſe* Empire to four Centuries or thereabouts before the Birth of our Saviour. By the true Epoque of the Empire underſtand not the Beginnings of the Nation, which is credible (as we have remarked before) remount to the next Ages after the Deluge; but the Beginning of the Monarchy, which is the Time, when the Incidents that happened in this Nation, appearing grounded on certain Proofs, deſerve the Credit of learned Men. This important Point once cleared up, ought to put an End to the Diſputes of the Learned on the fabulous Antiquity of *China*.

Some Amendments and Additions to the Account of Things found under Ground in Lincolnſhire, *in the* Tranſact. N° 279. *By Mr.* Ralph Thoresby, *F. R. S.* N°. 377. p. 344.

III. Whereas there is ſome Difference betwixt the Accounts of the Depth of the Things found; that in the Letter, *Sect.* 5, accounting it to be about 8 or 10 Foot, and that in the Letter, *Sect.* 4. to be 12 or 14 Foot deep; the Reader may pleaſe to underſtand, that the Depth was not meaſured, but conjectured, and accounted for according to the Relator's beſt Remembrance. That which makes the Depth the greater being that of *Sect.* 4. (firſt placed, but laſt writ) was writ upon Information (but by Conjecture alſo) of another that lived near the Place, and viewed it often. But the Difference may eaſily be accommodated or ſalved, by ſuppoſing (which will not be far from Truth) that when the Labourers or Dikers firſt diſcovered and encountered the Jetties and other Things there found, it might be about the Depth of 8 or 10 Foot; but the Bottom of them, when they came to be all taken up, might be at the Depth of about 12 or 14 Foot, as in the other Relation.

Take notice alſo, concerning what is ſaid *pag.* 1159. *lin.* 14. that ſome very judicious Perſons ſay, that the Stones which the Spectators ſaw at the Botton of *Hammon Beck*, were ſuch as the Dikers had firſt thrown out, (when they were taking up the old Goat) and were fallen

* *The* Chineſe *ſay of this Star, that it was a Sign of Renewal in the World.*

The Year Letters.

1 甲 Kia.
2 乙 y.
3 丙 Ping.
4 丁 Ting
5 戊 Uou.
6 己 Ki.
7 庚 Keng.
8 辛 Sin.
9 壬 Gin.
10 癸 Kuei.

The hour Letters.

1 子 Tse.
2 丑 Tcheou.
3 寅 yn.
4 卯 mao.
5 辰 Chin.
6 巳 Se.
7 午 ou.
8 未 Wei.
9 申 Chin.
10 酉 yeou.
11 戌 Sio
12 亥 hai.

(1) 甲 Kia. 子 Tse.
(2) 乙 y. 卯 mao.
(3) 姑 Chi. 皇 hoang. 帝 Ti.
(4) 庚 Keng. 辰 Chin.
(5) 黃 hoang. 帝 Ti.
(6) 甲 Kia.
(7) 乙 y.
(8) 閼 o. 逢 Fong.
(9) 旃 Tchcou 蒙 Mong.
(10) 丙 Ping.
(11) 彔 Jeou. 兆 Tchao.
(12) 子 Tse. 午 ou.
(14) 困 Kouen. 敦 Tun.
(15) 敦 Tun. 牂 Tsang.
(16) 羊 yang.
(17) 丬 Tsang.
(18) 午 ou.
(19) 丙 Ping. 辰 Chin.
(20) 丁 Ting. 亥 hai.
(21) 戊 uou. 子 Tse.
(22) 甲 Kia. 申 Chin.
(23) 元 yuen.
(24) 癸 quei. 酉 yeou.
(25) 玄 hiuen.
(26) 五 Cæli. 子 filius.
(27) 聖 Ching. 祖 Tsou. 仁 gin. 皇 hoang. 帝 Ti.
(28) 胤 yn. 禎 Tchin.
(29) 症 yong. 正 Tching.
(*) 丘 Tse. àse. 王 Wang. Regnans

(13) 生物之初 其本原昔 芝子子者 黃物之所 以始也

fallen in again. But that it was a hard and firm Soil is certain; and probably that on which the famous Steeple of *Boſton* ſtands. See the Record of the Foundation of the ſaid Steeple in the *Philoſ. Tranſact.* Numb. 223. pag. 243.

The Form of the Shoe Soles found at *Spalding* was after this Manner, each Foot had its proper Shoe: This was for the right Foot.

Now, by ſome Paſſages in Hiſtory, it may probably be conjectured, when thoſe Shoe Soles were left there, and how long it may be ſince that Alteration, that makes the preſent Country, began. Take an Inſtance or two.

In *Stow*'s Chronicle, *ad An.* 1465. we read of the Proclamation againſt the Beaks or Pikes of Shoone, or Boots, that they ſhould not paſs two Inches upon Penalties there mentioned. And by other Paſſages in Hiſtory it appears, that thoſe Pikes of Shoes were before that Time exceeding long, and held up by Chains, that they might be rich, as well as ornamental. The other Inſtance is this.

In *Meclhior Adamus*'s Life of *Conrad Pellican*, at the Bottom of Page 263, in the *Octavo* Edition, there is this Paſſage. *Illo ipſo tempore (viz. Anno* 1484.) *milites ex* Flandria *reverſi multa nova introduxerunt, nempe variegatas caligas, obtuſos calceos, qui antea acuti geſtabantur a viris & mulieribus, ſimul quoque novum ſandaliorum genus obtuſum, quod vocabant* Pantofflen, *quibus ſuos etiam parentes uti conſpexit, omiſſis paulatim calopodiis* Holzschuh *dictis: quæ quidem novitates interim immenſum creverunt.*

Now by this Account it appears, that it is not much above 200 Years ſince thoſe Shoes before deſcribed, were worn; and conſequently it cannot be much longer, ſince the Earth hath been raiſed there to the Thickneſs before mentioned, *viz.* of 10 or 12 Foot; and ſince *Bicker* Haven grew up to be (as now it is) higher Land than the Country on each Side of it. By which may be conjectured, what a Change a Century or two more may make in the Outfalls of the Rivers of *Witham*, *Welland*, *Nyne* and *Ouſe*; and conſequently the Neceſſity of taking ſome other Method for preventing the impending Miſchiefs, which threaten rhe Navigation of the ſaid Rivers, and thoſe who have Eſtates and Intereſts in the great Level of the Fens, and are concerned about the Draining of them.

An Account of a Roman *Inſcription, found at* Chicheſter. *By* Roger Gale, *Eſq; F. R. S.* No. 379. p. 391. Fig. 2.

IV. This Inſcription, as curious as any that has yet been diſcovered in *Britain*, was found the Beginning of laſt *April* at *Chicheſter*, in digging a Cellar under the Corner-houſe of St. *Martins-lane*, on the North-Side as it comes into *North-ſtreet*. It lay about four Foot under Ground, with the Face upwards, by which it had the Misfortune to receive a great deal of Damage from the Picks of the Labourers as they endeavoured to raiſe it; for beſides the defacing of ſeveral Letters, what was here diſinterred of the Stone was broke into four Pieces: The other Part of it, ſtill wanting, is, in all Probability, bury'd under the next Houſe, and will not be brought to light till that happens

happens to be rebuilt. The Inſcription is cut upon a grey *Suſſex* Marble, the Length of which was ſix *Roman* Feet, as may be conjectured by meaſuring it from the Middle of the Word TEMPLUM to that End of it which is entire, and is not altogether three Foot *Engliſh*, from the Point mentioned. The Breadth of it is 2 $\frac{3}{4}$ of the ſame Feet, the Letters beautifully and exactly drawn, thoſe in the two firſt Lines three Inches long, and the reſt 2 $\frac{1}{4}$.

Being at *Chicheſter* in *September* laſt with Dr. *Stukely*, we took an accurate View of this Marble, which is now fixed in the Wall under a Window within the Houſe where it was found, and that we might be as ſure of the true Reading as poſſible, wherever the Letters were defaced, we impreſſed a Paper with a wet Sponge into them, and by that Means found thoſe in the fifth Line to have been as we have expreſſed them above, and not as in other Copies that have been handed about of this Inſcription.

The only Letter wanting in the firſt Line is an N before EPTVNO, and ſo no Difficulty in reading that. As to the ſecond, though it was more uſual in Inſcriptions of this Nature to expreſs the Donation by the Word SACRVM only, referring to the *Temple* or *Altar* dedicated; yet we have ſo many Inſtances in *Gruter*'s *Corpus Inſcriptionum* of TEMPLVM and ARAM alſo cut on the Stones, that there is not the leaſt Occaſion to ſay any Thing farther upon that Point.

The third Line can be no other Way filled up, than as I have done it by the pricked Letters: I muſt own, however, that I have had ſome Scruple about the Phraſe of DOMVS DIVINA, the ſame Thing as DOMVS AVGVSTA, the *Imperial Family*, which I cannot ſay occurs, with any Certainty of the Time it was uſed in, before the Reign of *Antoninus Pius*, from whom, down to *Conſtantine the Great*, it is very frequently met with in Inſcriptions. This kept me ſometime in Suſpenſe, whether this found at *Chicheſter* could be of ſo early a Date as the Time of *Claudius*: But as we find ſeveral Inſcriptions in *Gruter* with thoſe Words in them, or I. H. D. D. *In honorem Domus Divinæ*, which is much the ſame Thing, without any Mark of the Time when they were cut, they may have been before the Reign of *Antoninus Pius*, and then only came into more general Uſe; and as the Time that *Cogidunus* lived in, will not let this be of a later ſtanding, I think we may offer it as an Authority for the Uſe of this Piece of Flattery to the Emperors long before that excellent Prince came to the Purple.

The third Line, as I believe, was EX AVCTORITATE. TIB. CLAVD. and the fourth COGIDVBNI. R. LEG. *&c.* that is, *Ex Auctoritate Tiberii Claudii Cogidubni Regis, Legati Auguſti in Britannia*; for the following Reaſons: We are informed by *Tacitus in Vita Agricolæ* *, That after *Britain* had been reduced to a *Roman* Province by

* Cap. 14.

the

the ſucceſsful Arms of *Aulus Plautius*, and *Oſtorius Scapula*, under the Emperor *Claudius*, *Quædam Civitates*, Cogiduno Regi *erant donatæ*, *is ad noſtram uſque memoriam fidiſſimus remanſit*, *vetere ac jam pridem recepta Populi Romani conſuetudine ut haberet inſtrumenta ſervitutis &* Reges. This *Cogidunus* ſeems to be the ſame Perſon as *Cogidubnus* in our Inſcription, the Letter B in the third Syllable making little or no Difference in the Word, eſpecially if pronounced ſoft, as it ought to be, like a V conſonant.

It is ſo well known to have been the Cuſtom of the Roman *Liberti* and *Clientes*, to take the Names of their Patrons and Benefactors, that it would be waſting of Time to prove the conſtant Uſage of that Practice. Now as this *Cogidubnus*, who, in all Probability, was a petty Prince of that Part of the *Dobuni* which had ſubmitted to *Claudius*, and one that continued many Years faithful to him and the *Romans* *, had given him the Government of ſome Part of the Iſland by that Emperor, nothing could be more grateful in regard to *Claudius*, nor more honourable to himſelf, after he was *Romaniſed*, than to take the Names of a Benefactor to whom he was indebted for his Kingdom, and ſo call himſelf TIBERIVS CLAVDIVS COGIDVBNVS.

I ſuppoſe him to have been a *Regulus* of the *Dobuni*; becauſe we are told by *Dion Caſſius* †, that *Aulus Plautius* having put to flight *Cataratacus* and *Togodumnus*, Sons of *Cunobelin*, part of the *Boduni* (the ſame People as the *Dobuni*) who were ſubject to the *Catuellani*, ſubmitted to the *Romans*; and the Name *Cogidubnus*, or *Cogiduvnus*, Coc o Dubn, or Duvn ‖, ſignifying expreſly in the *Britiſh* Language PRINCEPS DOBVNORVM, ſeems to put the Matter out of all doubt.

How far his Territories extended, it is impoſſible to define. Biſhop *Stillingfleet* § ſuppoſes them to have lain in *Surrey* and *Suſſex*; *Suſſex* certainly was Part of them, ſince the Temple mentioned in this Inſcription was erected in it by his Authority; and it is not unlikely, that beſides the *Regni*, who were the People of thoſe two Counties, he might have that Part of the *Dobuni* which had ſubmitted to the *Romans*, and ſeems to have been his own Principality, together with the *Ancalites*, *Bibroci*, and *Segontiaci*, whoſe Countries lay between the *Dobuni* and the *Regni*, beſtowed upon him; the Words *Civitates quædam* in *Tacitus*, not importing no more than ſome *few Towns*, but *ſeveral People*, the Word *Civitas* always ſignifying a *People* in that Hiſtorian.

Before I proceeded any farther, it will not be amiſs to obſerve, that *Togodumnus* and *Cogidumnus*, though their Names are ſo much alike, were two diſtinct Perſons: The firſt was Son of *Cunobelin*, King of the *Trinobantes*, vanquiſhed and killed in Battle by *Aulus*

* V. Tacit. ut ſupra. † In lib. LX. ‖ V. Baxteri Gloſſar. in verbis Cogidvmnvs, & Dobvni. § Origin. Britan. p. 63.

Plautius. The ſecond a Prince that ſubmitted to *Oſtorius Scapula*, and continued in his Fidelity to the *Romans*, *in noſtram uſque memoriam*, ſays *Tacitus*, who was born at the latter End of *Claudius*'s Reign; ſo that *Togodumnus* was probably dead before *Cogidumnus* had his Government conferred upon him.

I call it his Government, for though by the Letter ·R· ſtanding in the Inſcription with a Point both before and after it, by which it plainly denotes an entire Word of itſelf, it may ſeem that it was intended for COGIGVBNI REGIS, and I believe was ſo in reſpect of his *quondam* Dignity, yet it is evident, that he had condeſcended to take the Title of LEGATVS AVGVSTI IN BRITANNIA from *Claudius*; and that too muſt have been only over thoſe People of whom he had given him the Government, *Aulus Plautius*, *Oſtorius Scapula*, *Didius Gallus*, *Avitus Veranius*, and *Suetonius Paullinus*; having the ſupreme Command ſucceſſively about this Time in this Iſland, the ſecond and laſt of which are called expreſly *Legati* by *Tacitus* *. The *Legati Cæſaris* or *Auguſti* were thoſe, *qui Cæſaribus ſubditas regebant Provincias*.

The ſixth Line has loſt at the Beginning the Letters COLLE, but ſo much remains of the Word as makes it to have been indubitably, when entire, COLLEGIVM, and the following Letters are an Abbreviation of FABRORVM.

Theſe Colleges of Artificers were very ancient at *Rome*, as ancient as their ſecond King *Numa Pompilius*, if we may believe *Plutarch* †, who tells us, that the People were divided by him into what we at this Day call *Companies of Tradeſmen*, and mentions the Τέκτονες or *Fabri* among them, though *Florus* ‖ ſays, that *Populus Romanus* a Servio Tullio *relatus fuit in Cenſum*, *digeſtus in Claſſes*, *Curiis atque* Collegiis *diſtributus*. But as the Power of the *Romans* extended itſelf, it carry'd the Arts of that great People along with it, and improved the Nations that it ſubdued, by civilizing, and teaching them the Uſe of whatever was neceſſary or advantageous among their Conquerors, from which moſt wiſe and generous Diſpoſition, among other beneficial Inſtitutions, we find theſe *Collegia* to have been eſtabliſhed in every Part of the Empire, from the frequent mention of them in the Inſcriptions collected by *Gruter*, *Spon*, and other Antiquaries.

Several Sorts of Workmen were included under the Name of *Fabri*, particularly all thoſe that were concerned in any kind of Building, whence we meet with the *Fabri Ferrarii*, *Lignarii*, *Tignarii*, *Materiarii*, *Navales*, and others; the laſt named may have been the Authors of dedicating this Temple to *Neptune*, having ſo near a Relation to the Sea, from which the City of *Chicheſter* is at ſo ſmall a Diſtance, that perhaps that Arm of it which ſtill comes up within two

* Lib. xii. Ann. cap. 32. & Vit. Agric. cap. 15. † In vit. Numæ.
‖ Lib. I. cap. 6.

two Miles of its Walls, might formerly have waſhed them. The reſt of the Fraternity might very well pay the ſame Devotion to *Minerva*, the Goddeſs of all Arts and Sciences, and Patroneſs of the *Dædalian* Profeſſion.

As no leſs than five Letters are wanting at the Beginning of the ſixth Line, there cannot be fewer loſt at the Beginning of the ſeventh, where the Stone is more broken away than above; ſo that probably there were ſix when it was perfect. What we have left of them is only the Top of an S; I will not therefore take upon me to affirm any Thing as to the reading of them, which is ſo entirely defaced; perhaps it was A. SACR. S. *a ſacris ſunt*; perhaps it was HONOR. S. *Honorati ſunt:* As to the former, we find theſe *Collegia* had their *Sacerdotes*, therefore *Qui a ſacris ſunt*, which is found in Inſcriptions *, would be no improper Term to expreſs them; or it might have been SACER. S. *ſacerdotes ſunt*, ſince we find ſuch mentioned in the following Inſcriptions †.

MAVORTI SACRVM
HOC SIGNVM
RESTIT — — — —
COLL. FABR. ARI
CINORVM ANTIQVISS.
VETVSTATE
DILAPSVM ET
REFECER. CVR. L. LVCILIVS
LATINVS PROC. R. P. ARIC.
ET T. SEXTIVS MAGGIVS
SACER. COLL. EIVSD.

Mavorti ſacrum hoc Signum reſtituit Collegium Fabrorum Aricinorum *Antiquiſſimum, vetuſtate dilapſum, & refecerunt. Curabant Lucius Lucilius Latinus, Procurator Reipublicæ Aricinorum, & Titus Sextius Maggius* Sacerdos *Collegii ejuſdem.*

‖ L. TERTENI AMANTI
SACER. COLL. LOTORVM
IIVIR. C. SARTIVS C. F.
ITERINVS ET. L. ALLIVS
PETELINVS D. D.

Lucius Tertenius Amantius Sacerdos *Collegii Lotorum, Duumviri Caius Sartius, Caii Filius, Iterinus, & Lucius Allius Petelinus Dedicaverunt.*

* V. Grut. Corp. XXIX. 8. CXXI. 1. DCXXXII. 1. Erud. Antiquit. p. 58.

‖ Ibid. p. 64.

† Spon. Miſcell.

As to the latter, thoſe Members of the College that had paſſed thro' the chief Offices of it, as that of *Præfectus*, or *Magiſter quinquennalis*, had the Title of HONORATI conferred upon them: You have ſeveral of theſe HONORATI mentioned in *Gruter*, particularly a long Catalogue of them *in Collegio Fabrorum Tignariorum*, p. CCLXVIII. 1. and in *Reineſius*'s *Syntagma* * there is an Inſcription.

EPAGATHO TVRANNO
HONORATO COLLEGI
FABRVM TIGNARIORVM
ROMANENSIVM, &c.

So that the Vacuity in our Inſcription may very well have been filled up with one or other of theſe Words, and the three next Letters that follow them D. S. D. *de ſuo dedicaverunt*, will agree with either of them, and what precedes them.

The laſt Line has been PVDENTE PVDENTINI FILio; but there muſt have been a Letter or two of the *Prænomen* at the Beginning of it, unleſs it was ſhorter than the reſt at that, as well as at the latter End of it; and from what I have ſaid, the whole may be read as follows.

Neptuno & Minervæ Templum pro Salute Domus Divinæ, ex Auctoritate Tiberii Claudii Cogidubni Regis, Legati Auguſti in Britanniâ, Collegium Fabrorum, & Qui in eo a Sacris [or [*Honorati ſunt, De ſuo Dedicaverunt, Donante aream Pudente Pudentini Filio.*

Chicheſter, by this Inſcription found at it, muſt have been a Town of Eminence very ſoon after the *Romans* had ſettled here, and in Proceſs of Time ſeems to have been much frequented, by the *Roman* Roads, ſtill viſible, that terminate here from *Portſmouth*, *Midhurſt*, and *Arundel*, though, what is very ſtrange, we have no *Roman* Name now known for it. I once thought it might have put in its Claim for *Anderida*, which our Antiquaries have not yet agreed to fix any where, being ſituated, very near, both to the *Sylva Anderida*, and the *Southern Coaſt* of the Iſland, the two Properties of that City †: But *Henry* of *Huntingdon*, who lived in the Time of *Henry* II. telling us, that the *Saxons* ſo deſtroyed *Andredeceſter*, that *Nunquam poſtea reædificata fuit, & locus tantum quaſi nobiliſſimæ urbis tranſeuntibus oſtenditur deſolatus* ‖, it could not be *Chicheſter*; for that was not only rebuilt before his Time, but was a Place of ſuch Note, that when the Biſhops, ſoon after the Conqueſt §, removed their Churches from ſmall decay'd Towns, where ſeveral of them were then ſeated, *in*

* Pag. 605. † V. Camb. *Brit. and* Sonners's *Roman Ports and Forts.* ‖ Pag. 312. V. *Dr.* Tabor's *Diſcourſe of* Anderida, Philoſ. Tranſ. Nº. 356. § A. D. 1076.

in Urbes Celebriores, *Stigand* then Biſhop of *Selſey* ſettled his Epiſcopal Chair at that Place.

I ſhall conclude with obſerving, that when this Inſcription was dug up, there were alſo two Walls of Stone diſcovered cloſe by it, three Foot thick each, one running North, the other Eaſt, and joining in an Angle, as the *North-ſtreet* and St. *Martins-lane* now turn, which, in all Probability, were Part of the Foundations of the Temple mentioned on the Marble.

A Human Skeleton of an extraordinary Size, found in a Repoſitory at Repton *in* Derbyſhire, *by* Simon Degg, M. D. *F. R. S.* N°. 400. p. 363.

V. *Repton*, *alias Repingdon*, is a Town on the *Trent* famous for the Burial of the *Mercian* Kings, whoſe chief Seat was at *Tamworth* in *Staffordſhire*. It is likewiſe remarkable for its Free-ſchool, and its ancient Abbey. Having viewed the Ruins in this Town, and enquiring for Antiquities, the Inhabitants brought us *Thomas Walker*, a Labourer, aged 88 Years, who gave the following Account.

About 40 Years ſince cutting Hillocks, near the Surface he met with an old Stone Wall, when clearing farther he found it to be a ſquare Encloſure of 15 Foot: It had been covered, but the Top was decayed and fallen in, being only ſupported by wooden Joyces. In this he found a Stone Coffin, and with Difficulty removing the Cover, ſaw a *Skeleton* of a *Humane Body* 9 *Foot* long, and round it lay 100 Humane Skeletons, with their Feet pointing to the Stone Coffin. They ſeemed to be of the ordinary Size. The Head of the great Skeleton he gave to Mr. *Bowers*, Maſter of the Free-ſchool. I enquired of his Son, One of the preſent Maſters, concerning it, but it is loſt; yet he ſays, that he remembers the Skull in his Father's Cloſet, and that he had often heard his Father mention this Gigantick Corps, and thinks this Skull was in proportion to a Body of that Stature. The Bottom of this Dormitory was paved with broad flat Stones, and in the Wall was a Door-caſe, with Steps to go down to it, whoſe Entrance was forty Yards off, nearer the Church and River. The Steps are Stone, and much worn: 'Tis in a Cloſe, on the North Side of the Church, and over this Repoſitory grows a Sycamore, planted by the old Man when he filled in the Earth. The preſent Owner will not ſuffer it to be opened, the Lady of the Mannor having forbidden it. This was atteſted to us by ſeveral old People, who had likewiſe ſeen and meaſured the Skeleton.

A Roman Pavement *found near* Grantham *in* Lincolnſhire, *by* W. Stukeley, *M. D. F. R. S.* N°. 402. p. 428.

VI. 1. In *Feb.* 1727-8. Plowing in the open Fields of *Denton*, about 2 ½ Miles from *Grantham*, they happened upon a *Roman Pavement* in *Moſaick* Work. It lies partly in the glebe Land, partly in Mrs. *Welby*'s, who aſſiſted us with Workmen to clear it. It has been a very large Room about 30 Foot both Ways, as we found by digging in divers Places; but being ſo near the Surface, not above a Foot, or a Foot and half deep, and having been ploughed over Time out of Mind, the major Part of it is ruined and imperfect. Beſides many Fragments

Fragments of it, we had only the Pleaſure of viewing one Piece entire, which was 30 Foot long and 6 broad; and this was extreamly pretty, the Colours lively, the Pattern or Figure finely deſign'd, as you
Fig. 3. will ſee by the Drawing, which is exactly taken. There are only 3 Colours, white, red, and blue; but of the middlemoſt or moſt beautiful Part of it, which is but 9 Foot long and 3 broad, the white and red is Double in Quantity to the blue. In the outermoſt Part or Verge of the Work, there is no Variety of Colour, but 'tis entirely blue; and that made of much larger Squares than the reſt. On the *Eaſt* and *Weſt* Sides this was 6 Foot broad, on the *North* but 3. The red is formed out of *Roman Bricks*, ſeveral Fragments of which we found about the Work; the white Colour is made of the *common Limeſtone* of our Country; the blue, of the Stone that comes from *Benyngton* towards *Newark*, 5 Miles from this Place: And theſe Colours wear well together, and produce a good Effect. We found in digging, ſeveral Parts of the Foundations of the Walls that terminated this Room, and ſeemingly Foundations of other Rooms adjacent, which Foundations were made of the common white Stone of the Country ſet on Edge Side by Side, with here and there a Bit of *Roman* Brick. The Building was placed parallel with the Quarters of the Heavens. They found in digging, ſome human Bones, and I took many Bones of a Hand, which probably belonged to ſome unfortunate Perſon killed in the Ruins, or when the Houſe was demoliſhed.

The Oeconomy of the Roman *Times near* Grantham, *by the ſame.* N°. 402. p. 430.

2. Three Miles South of *Grantham* is *Great Paunton*, a Village ſet in a ſweet Valley, where the Beginnings of the *Witham River* are collected from many Springs a little higher up. Hard by upon the Edge of the Hill runs the great *Roman* Road called *Hermen-ſtreet*: This Village I aſſerted in my Itinerary to be the *Cauſennis* in *Antoninus*'s Itinerary, which Commentators have found Difficulty in ſettling. The *Terms* or 2 *Towns* between which it is placed in *Iter* V. with the Diſtance of the Miles, ſufficiently eſtabliſh the Situation, and they are well known and acknowledged; thus *Durobrivas*, *Cauſennim*, m. p. xxx. *Lindum* m. p. xxvi. for *Paunton* is 30 *Roman* Miles from *Durobrivæ*, or the Paſſage of the *Hermen-ſtreet* over the *Nen-river* above *Peterborough*, and 26 from *Lincoln*. At *Paunton*, ſince I came to live at *Grantham*, I have heard of much Antiquity being found, eſpecially *Moſaic Pavements*; and undoubtedly it was the *Station* upon the *Hermen-ſtreet*, between *Brigcaſterton* 12 *Roman* Miles off, and *Ancaſter* 7, which were likewiſe *Roman* Stations and walled about, but now their Names are loſt. All about *Paunton* the *Romans* inhabited very frequent, as at *Kirkſtoke* particularly, where great Quantities of Antiquities have been found; likewiſe at *Strawſton* I have ſeen many *Roman* Coins dug up, in Poſſeſſion of my Neighbour Captain *Hacket*, who owns the Town. He ſays likewiſe ſubterraneous Vaults have been found there, and near it is the Place where

Fig. 1

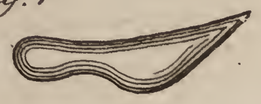
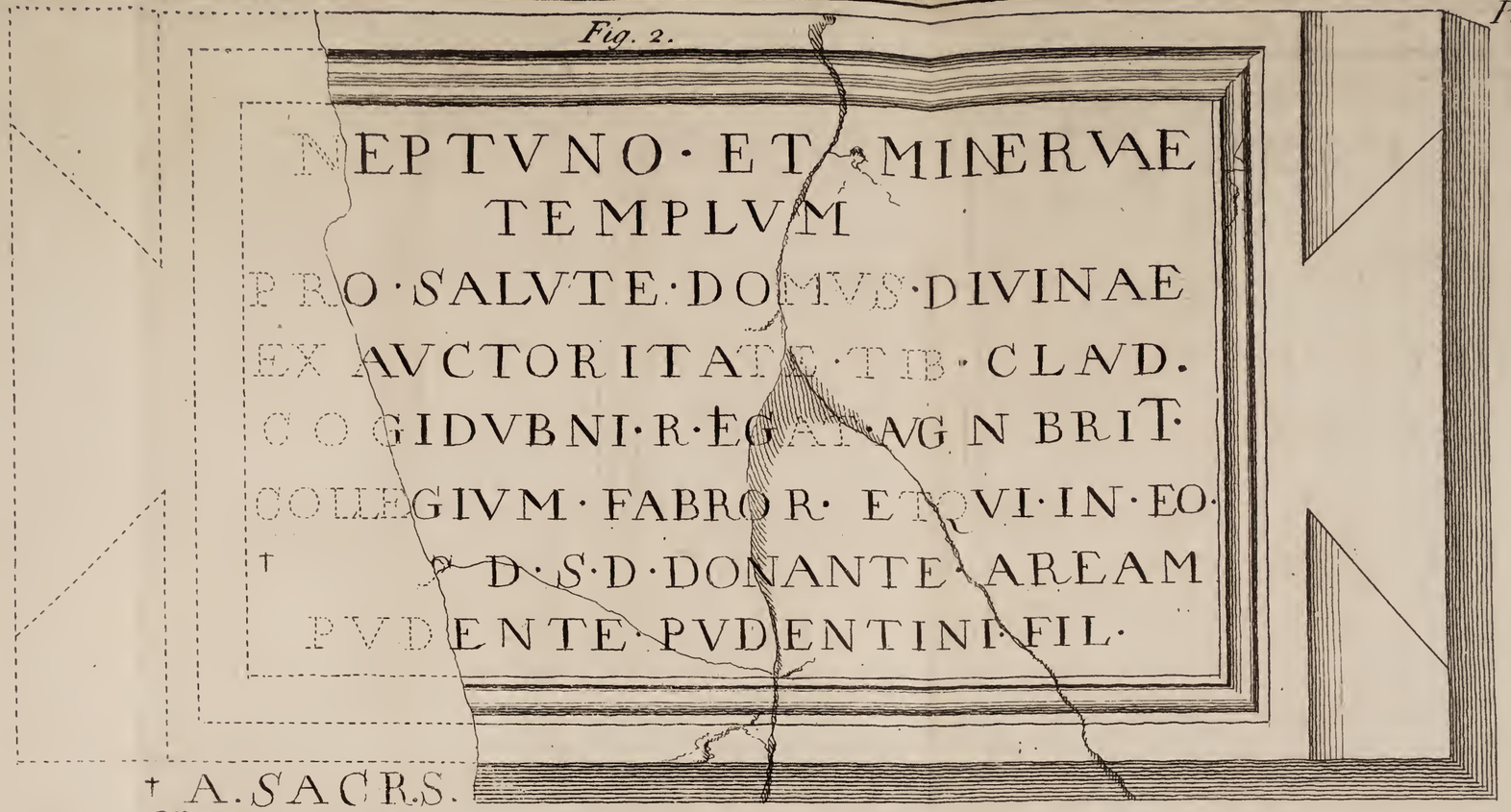
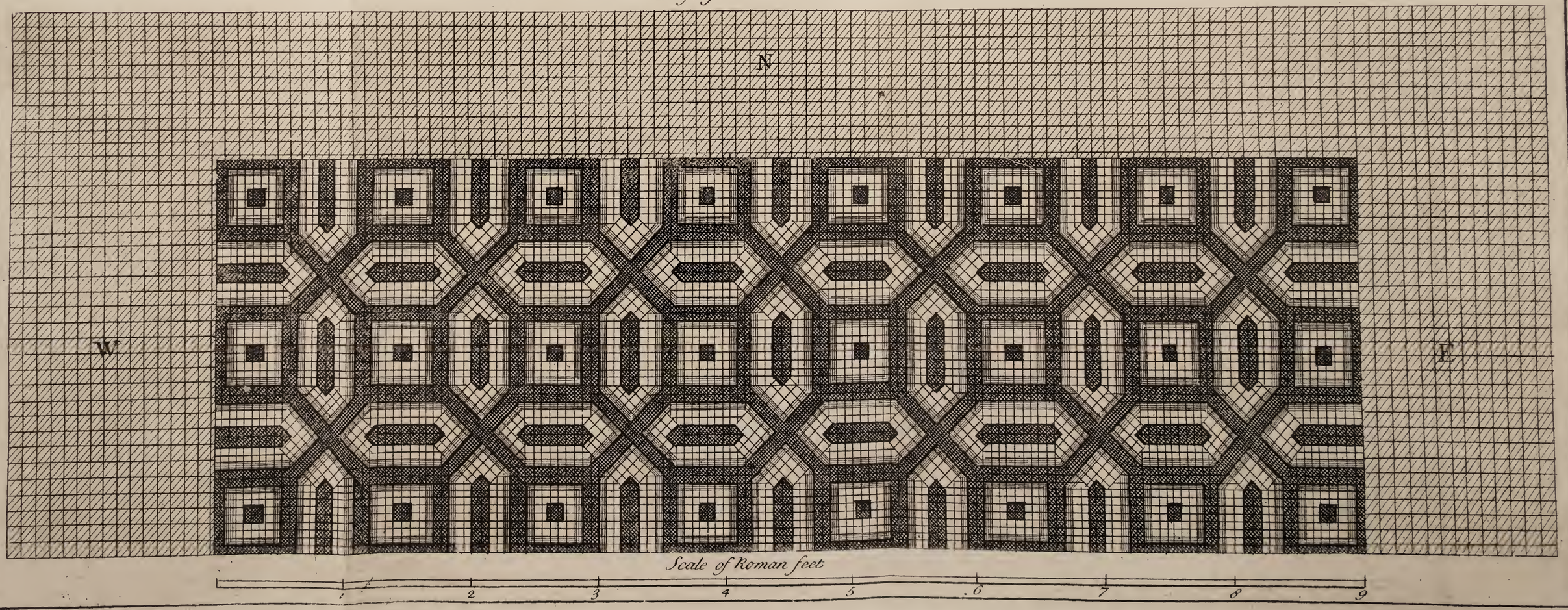


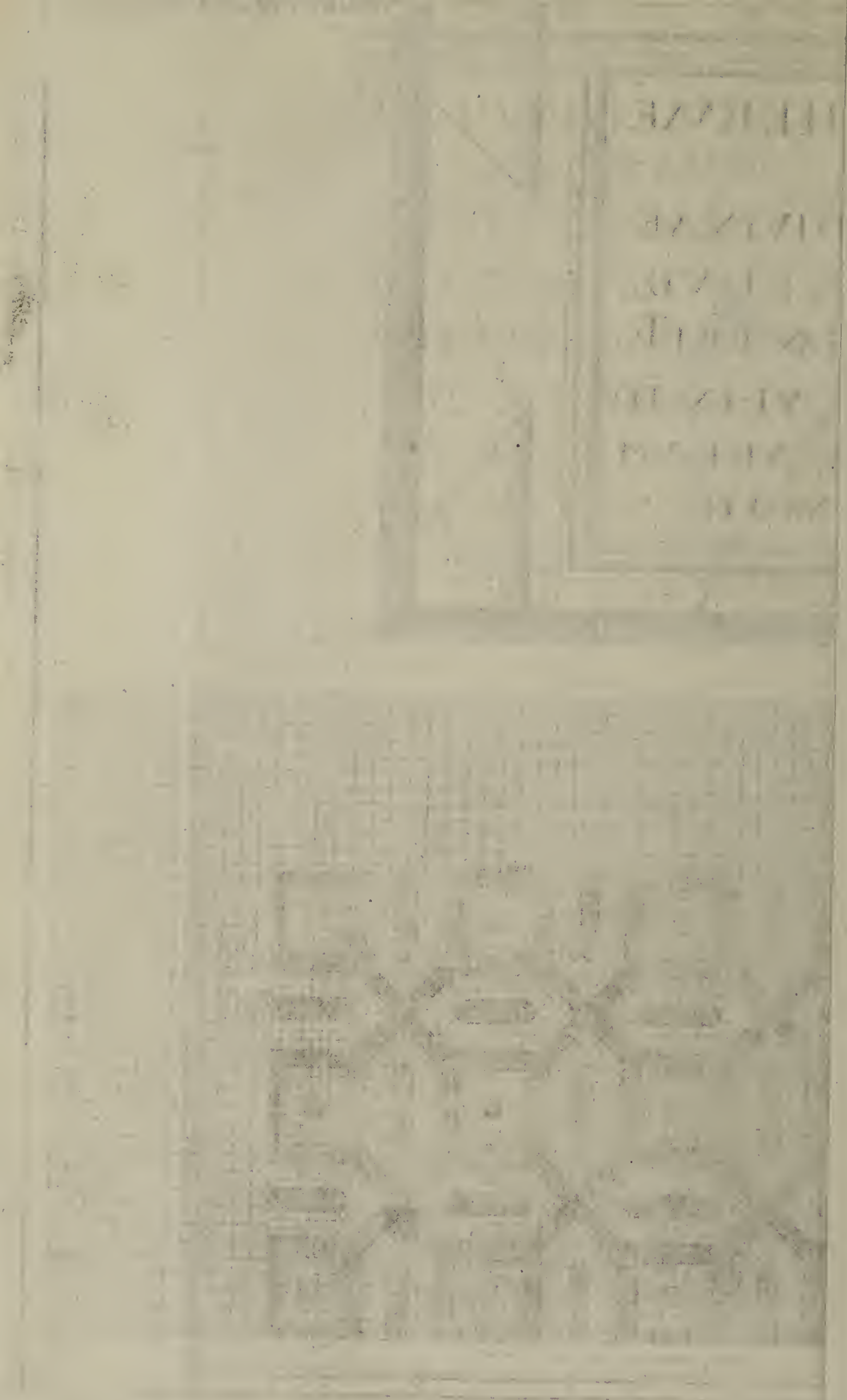
Fig. 2.



† A. SACR. S.
or HONOR. S.

Fig. 3





where our Pavement was discovered. Between *Paunton* and *Grantham* a *Road* passes the River at *Salter*'s *Ford*, this Road is called *Salter*'s *Gate*, and much frequented. I believe it has continued ever since the *Roman* Times, being the Passage from *Holland* in *Lincolnshire* by *Brigend Causey*, (a *Roman* Work) to all the Towns upon the *Foss-way* in *Nottinghamshire* and *Leicestershire:* For along this Way they carried Salt, made by the Sea Side, to those Mediterranean Parts, both in *Roman* and *Saxon* Times. Our Pavement stands within a Bow-shot of this Road, upon very high Ground, and seems to have been a *Summer-villa*, or Pleasure-house, where on one Side they were entertained with the Sight of Travellers going on the Road; on the other they commanded a most noble Prospect Northwards, of a prodigious Extent. When we are upon the Spot, we may without Difficulty see the Reason why they fixed it in that very Point, and 'tis the most delightful Place that can be imagined for a Summer-retreat. 'Tis placed just at the Head of a *Convallis*, or lesser Valley falling down into the great Valley of *Denton* underneath, from which *Denton* has its Name, signifying the *Town in the Valley*. This *Convallis* is extreamly beautiful, and running Northward, must needs be very pleasant and cool in the Summer-time. Our *Villa* had this further Advantage in its Situation, that it commanded a View between the Opening or Gap that in this Place appears, between *Barrowby* and *Wolsthorp Hills*; which leads the Eye into the boundless Prospect of the Vale of *Belvoir*. You see from hence *Newark*, the *Trent*, *Kelham Park* and *House*, *Southwell Minster*, the *Forest* of *Sherwood*, &c. besides the *neighbouring Castle of Belvoir*, where in these Times was a *Roman exploratory Camp*, likewise the *Roman* Camp of *Humington*; insomuch that we may well commend the Wisdom and good Taste of the Builder, who contrived so well for *Security* and *Pleasure*. For *Air*, the Country hereabouts has always, and deservedly, been reckoned the *Montpelier* of *England*; for *Water*, *Wood*, *Heath*, and *Prospect*, it may be thought the *Frescati*.

Of the Equuleus, *or Wooden Horse of the Antients, by* John Ward, *Rhet. Prof. Gresh. F. R. S.* Nº. 412. p. 231.

VII. In quem finem equuleus primo institutus fuerit, & ad quem usum adhibitus, ex multis veterum scriptorum locis satis manifesto constat. Formam autem atque fabricandi rationem cum nemo eorum descripserit, in varias de hac re sententias, easque haud parum a se invicem discrepantes, doctissimi homines abierunt. Neque hoc mirum profecto ei videbitur, qui quam difficile haud raro sit de rebus per multa secula desuetis, & a conspectu remotis, certi aliquid statuere, secum perpenderit; idque praesertim si antiqui auctores, qui eas commemorant, leviter tantum id faciant, nec plene describant. Quod cum equuleo, ut dixi, evenerit; nec ullus eruditorum, qui post renatas literas hanc machinam nobis explicare suscepit, rem adeo feliciter expediisse mihi videretur, ut descriptio cum iis, quæ veteres de illa tradunt, per omnia congrueret; certius atque exploratius aliquid

quid aſſequendi ſpem omnem prorſus abjeceram. Ceterum inter chartas quaſdam Roma tranſmiſſas, in quibus variæ imagines antiqui operis, jam illic extantes, delineatæ ſunt, quas vir eruditiſſimus, & Medicus Regius RICHARDUS MEADIUS, haud ita pridem mihi conſpiciendi copiam præbere dignatus eſt, in unam forte fortuna incidi, a marmore anaglyptico in palatio Principis *Burgeſii* adſervato deſcriptam; quæ, ut ſtatim conjectabar, hominem in equuleo ſuſpenſum exhibuit. Hujus igitur uſu mihi perhumaniter conceſſo, rem totam attentius conſiderare; loca apud veteres ſcriptores, in quibus equulei mentionem faciunt, ſtudioſius exquirere; & cum hac imagine diligenter conferre cœpi: unde tandem evenit, ut non ſolum omnes, qui ſeculis recentioribus de equuleo tractaverant, a vero aberraſſe, ſed & cauſas quoque errorum, ut mihi videbatur, plane perſpexerim. Quorum utrumque ex iis, quæ de antiqua hac machina jam dicturus ſum, ni fallor, manifeſto apparebit.

Equuleus igitur, ſi ad vocis originem attendamus, *pullum equinum*, vel *parvum equum*, ſignificat, ut ex his Tullii verbis intelligimus: *Chryſippus omnia in perfectis & maturis docet eſſe meliora; ut in equo, quam in equuleo* *. Atque hinc formam, pariter ac nomen, machina, de qua agimus, primo accepit.

Equuleum autem cum *cruce* nonnulli minus recte confuderunt. Crux enim patibulum fuit, cui ſervi affixi, aliique abjectae conditionis homines, ultimo ſupplicio afficiebantur. In equuleo autem quaeſtiones vi tormentorum habebantur ad crimina eruenda. Sic Val. Maximus de ſervo quodam meminit, qui ſexies in equuleo tortus culpam pernegavit; et nihilominus a judicibus poſtea damnatus, et in crucem actus eſt †. Nec forma igitur, nec fine inſtituto, equuleus cum cruce conveniebat.

Inter varias autem de equuleo ſententias duas tantum, utpote quae propius ad veritatem accedunt, hic memorabo. Altera eſt Hieron. Magii (quem ſequitur Gallonius ‖) qui *ad equi imaginem* factum recte judicavit §; altera vero eſt Caraccioli, qui *ſtipitem erectum* fuiſſe haud minus recte cenſuit *. In eo autem utrumque lapſum eſſe (ut de aliis erroribus taceam) quod unam ſemper formam habuiſſe exiſtimaverint, jam demonſtrare conabor.

Seculis igitur antiquioribus equuleum ad equi imaginem quodam modo fabricabant, dorſo in eam longitudinem ac latitudinem complanato, ut hominem in illud porrecto corpore impoſitum ſatis convenienter capere poſſet. Qui torquendus enim erat, non inſidebat, ſed brachiis ſub equulei pectore retortis, vinctis manibus, pedibuſque protenſis, jacebat ſupinus. Duabus etiam trochleis diverſae magnitudinis equuleum inſtruebant; quarum minor inter clunes in hunc finem excavatos, major vero, eademque manubriata, ſub ventre collocabatur.

* De N. D. l. 2. c. 14. † L. 8. c. 4. ‖ De S S. Martyrum cruciat. c. 3.
§ De equul c. 1. * Apud Ferrar. Elect. l. 1. c. 5.

locabatur. Tortor autem cum utrumque pedem funiculis vel nervis (qui fidiculae dicebantur) ligaſſet, hos deinde contorquens, ac per trochleam minorem ducens, majori affixit; tum majorem hanc trochleam manubrio circumagens corpus eo uſque extendere potuit, dum artus atque oſſium compagines haud ſine maximo dolore luxarentur.

Jam veterum ſcriptorum teſtimonia, quibus haec deſcriptio confirmari poſſit, proferemus. Formam igitur equinam ratio nominis (ut ſupra obſervatum fuit) aperte ſatis indicare videtur; ſicut apud nos hodie ſimile quoddam inſtrumenti genus, quod vocamus *the wooden-horſe*, ad poenas militares adhibetur. Idem quoque locutiones iſtae declarant, quae ab equo deſumtae de equuleo pariter uſurpantur. Ita non tantum *conjici*, et *imponi*, ſed etiam *ire in equuleum*, apud Ciceronem legimus *. Atque hinc Pomponii jocus in verſibus Atellanicis:

At ubi inſilui in cocleatum equuleum,
Ibi tolutim tortor †.

Ubi voces *inſilire* et *tolutim* ab re equeſtri aperte traxit poeta. Porro cum *cocleatum* [legerem *trochleatum*] equuleum dicit, cocleis vel trochleis fuiſſe inſtructum oſtendit. Homines autem in equuleo jacere ſolitos docet Seneca, cum ait: *Hoc nobis perſuadere conaris, nihil intereſſe, utrum aliquis in gaudio ſit, an in equuleo jaceat* ‖. Quin et fidiculis corpus fuiſſe extenſum teſtis eſt Fabius, apud quem pater, quod filium torquendo occiderat accuſatus, ita loquitur: *An tu quaeſtionem illam fuiſſe credis, qualis vernilibus corporibus adhibetur? Ideo enim equuleum movebam artifex ſenex, tendebam fidiculas ratione ſaevitiae, ut leniter ſedibus ſuis emota compago per ſingulos artus membra luxaret* §. Unde etiam Seneca hominem in equuleo *longiorem fieri* dicit *. Atque ut ea de cauſa manus pedeſque adſtringi neceſſe erat; ſic illa, qua diximus, ratione id factum fuiſſe infra oſtendemus. Huic autem equulei deſcriptioni, quod de Zenone philoſopho traditur, adprime convenire videtur. Is enim, *cum a Nearcho tyranno torqueretur, doloris victor, ſed ultionis cupidus, eſſe dixit, quod eum ſecreto audire admodum expediret; laxatoque equuleo, poſtquam inſidiis opportunum tempus animadvertit, aurem ejus morſu corripuit, nec ante dimiſit, quam et ipſe vita, et ille corporis parte privaretur* †. Jam homo in equulei dorſum, ut ſupra explicuimus, jacens tanto ſpatio ab humo diſtabat, ut ori ipſius alius commode ſatis aurem applicare poſſet; ideoque cum fidiculas tortor laxaſſet, attractis parum pedibus, et capite inflexo, aurem ejus morſu facile corriperet.

Porro veriſimile videtur aeneum taurum, quem confecit Perillus, et Phalaridi obtulit, hinc ortum ſuum habuiſſe. Ab hoc enim crudeliſſimo tyranno homines ταυροῦσθαι ſolitos teſtantur Plutarchus ‖ et Aelianus §; qua voce Aelianum *equulei extenſionem* intellexiſſe ipſe alibi oſtendit *.

* Tuſc. Qu. l. 5. c. 5. † Apud Non. in voc. *tolutim.* ‖ Epiſt. 66. § Declam. 19. * Epiſt. 67. † V. Max. l. 3. c. 3. ‖ Parall. c. 39. § Var. Hiſt. l. 2. c. 4. * Apud Suid. in voce ταυροβολίμεν@.

Sic in Gloſſar. Philoxeni, στρεβλωτὴς *equuleus*. Cum peritus igitur iſte ſceleris artifex, Perillus, homines in equuleo tortos gemitibus ſuis et ejulatibus ſonitum, taurorum mugitui non prorſus abſimilem, edere, obſervaſſet; quo artis adjumento res quam proxime adſimilari poſſet, de equina effigie in taurinam mutanda, hominibuſque ei includendis primum cogitaſſe haud abſurde credatur.

Ceterum equina iſta ſpecies non ſemper, ut diximus, equuleo permanſit; ſed poſteris aetatibus in aliam longe diverſam fuit mutata. Forma autem converſa, ut idem nomen retineret, huic machinae cum multis aliis rebus fuit commune. Nam, ut alias omittam, machina iſta bellica, quae ab arietini capitis ſimilitudine *aries* dicebatur, non eam perpetuo ſpeciem habuit, unde ab initio nomen accepit *.

Equuleus igitur hiſce temporibus ſtipes erat in altum erectus; cujus ſummae parti lignum tranſverſum, atque cornuum more utrinque curvatum, impoſitum eminebat. Duplici etiam trochlea, ut prior iſte, inſtruebatur; minori imae parti ſtipitis, ad eam recipiendam excavatae, inſerta; ac majori manubriata, poneque affixa. Torquendus autem homo in equuleum ſublatus, brachiis in lignum tranſverſum retortis, manibuſque poſt tergum ſtipiti devinctis, pendebat; fidiculis etiam pedes ligabantur, quas per trochleam deinde minorem tranſmiſſas major averſae equulei parti affixa recipiebat, cujus circumactu corpus extendebatur.

Cum de hac autem equulei ſpecie veteris eccleſiae ſcriptores, qui martyrum acerbiſſimos cruciatus ſub Romanis imperatoribus literis conſignarunt, ſaepiſſime mentionem faciant; eorum potiſſimum teſtimoniis utemur in forma illius demonſtranda. *Stipitem* inter alios S. Hieronymus appellat †. Item Prudentius:

Jubet amoveri noxialem ſtipitem ‖.

Atque in altum fuiſſe erectum ex eo apparet, quod torti homines in illo *ſuſpendi* ac *pendere* dicebantur; ut ex Euſebii & Prudentii verbis mox adducendis videbimus. De ligno tranſverſo nihil apud antiquos auctores invenio; quod multis eruditorum allucinationibus in hac machina deſcribenda cauſam dediſſe, fas eſt ſuſpicari. Sed in imagine, quam infra delineatam exhibebimus, lignum illud bicorne plane conſpicitur. Trochleis quoque inſtructum fuiſſe, ex illis Euſebii verbis colligi poteſt: *Quidam, manibus poſt tergum revinctis, ad ſtipitem ſuſpendebantur, ac membrum unumquodque* μαγγάνοις *quibuſdam diſtendebatur* §. Ubi vocem μαγγάνοις, quae machinae cuicunque fere nervis aut manubrio inſtructae convenit, plurali numero adhibens, trochleas ſignificare videtur. Porro ut manus poſt tergum vinctas fuiſſe hic docet Euſebius; ſic brachia retorta memorat Prudentius, ubi judicem ita imperantem inducit:

Vinctum

* Vid. Lipſ. Poliorcet. l. 3. dial. 1. † Epiſt. ad Innoc. 49. ‖ Περὶ στεφ. Hymn. 10 v. 114. § Hiſt. Eccleſ. l. 8. c. 10.

Vinctum retortis brachiis
Surſum ac deorſum extendite,
Compago donec oſſium
Divulſa membratim crepet *.

Item pedes vinciri ſolitos ex alio ejuſdem poetae carmine apparet, in quo martyr ex equuleo ſic loquitur :

Miſerum putatis, quod retortis pendeo
Extentus ulnis, quod revelluntur pedes †.

Quo pedes autem revelli poſſent, prius adſtringi debebant. Ex utriuſque etiam ſcriptoris verbis ſtipitem, ut diximus, erectum fuiſſe appareret. Atque hinc judex *ſurſum ac deorſum* eodem tempore corpus extendi jubet. Etenim hac corporis poſitione, dum pedum revulſu inferiores ejus partes deorſum extenderentur, humeros tranſverſo ligno ſuffultos, nexuque manuum ad ſtipitem repreſſos, ſurſum protrudi atque luxari neceſſe erat. Et quia ab humo elevati pendebant, hinc apud Sozomenum praeſes Chriſtianum hominem in equuleo torquendum ἀ'ιωρεῖσθαι, *ſublimem tolli*, praecipit ; cui is, latera nudans, non opus eſſe inquit, ut lictores ipſum in equuleum levando, ac poſtea deponendo, fruſtra defatigentur ‖. Imo quo poenae conſpectiores eſſent, equuleos in cataſta fuiſſe conſtitutos, haud male ſenſiſſe videtur Ferrarius § ; de qua martyris verba apud poetam, jam ſaepius laudatum, intelligi poſſe obſervat :

Emitto vocem de cataſta celſior *.

Quibus et illa, ni fallor, ejuſdem carminis adjungi poſſint :

Incenſus his Aſclepiades juſſerat
Eviſcerandum corpus equuleo eminus
Pendere †

Cataſta autem pegma vel tabulatum eſt, in quo apud nos qnoque ii collocantur, quibus *numellae* poena infligitur. Sigonium ‖ igitur, alioſque viros doctiſſimos, cataſtam de ipſo equuleo perperam accepiſſe cenſet Ferrarius. Et revera, ni equuleus in cataſta collocatus eſſet, qua ratione *corpus* in eo *eminus pendens* tortores ungulis ſuis ferreis *eviſcerare* poſſent ? Proinde fidiculas ad corpus extendendum in hac forma equulei, aeque ac priori, adhibitas fuiſſe, ex Codice Juſtiniani diſcimus ; ubi Valentiniani imp. edicto *decuriones exſortes omnino earum eſſe poenarum, quas fidiculae et tormenta conſtituunt*, jubentur §. Hiſce autem verbis equuleum veteres haud raro deſcribere ſatis notum eſt.

Jam ſi verba et locutiones, quae diverſis temporibus equuleo tributa ſunt, paulo attentius conſideremus ; eidem formae nequaquam congruere, neceſſario fateri cogemur. Primum enim ex novo adjecto nomine formae mutationem colligere licet. Nam vox *ſtipes* machinae ad equi imaginem factae nullo modo convenire potuit. Quare aut effigiem equinam, contra certam vocis *equulei* interpretationem, ac veterum

 locutiones

* Ubi ſupra, Hymn. 5. v. 109. † Ibid. Hymn. 10. v. 491. ‖ Hiſt. Eccleſ. l. 5. c. 2. § Elect. l. 1. c. 6. * Ubi ſupra, Hymn. 10. v. 467. † Verſ. 108. ‖ De Judic. l. 3. c. 17. § L. 16. de quæſt.

locutiones ab illa desumtas, nunquam habuisse dicendum est ; aut cum stipes deinceps vocari coepit, aliam formam accepisse. Praeterea antiquius *jacere*, postea vero *pendere* et *suspendi* in equuleo homines dicuntur ; qui duo corporis situs, tam longe diversi, formam machinae haud minus diversam requirunt. His accedit, quod alteri formae alterum effectum adscribi videtur. Vetustioribus enim seculis corpus simpliciter *extendi* dicitur, utpote in planum porrectum ; sequentibus vero aetatibus *sursum ac deorsum*, quod pendenti convenit, id fieri jubetur. Denique in priori equuleo homo decumbens ea fuit altitudine, ut in aurem alicui susurrare posset ; quod in posteriori suspenso propter nimium a solo spatium haud omnino congruit. Et quis jam non videt hanc verborum ac locutionum discrepantiam ad duplicem equulei speciem necessario referendam esse ? Certe homines isti eruditi, qui aliter senserunt, dum omnia apud veteres de hac re loquendi genera sententiae suae accommodare conati sint, eis difficultatibus fuerunt impliciti, unde nullo modo sese explicare potuerunt.

Verum ne qua hoc in dubium vocandi ansa in posterum restet, duo testimonia ex iis temporibus, quibus stipitis formam equuleo supra tribuimus, a Gallonio in contrarium allata *, breviter diluemus. Alterum ex illis S. Hieronymi verbis petitur : *Cum equuleus corpus extenderet, et manus post tergum vincula cohiberent ; oculis, quos tantum tortor alligare non poterat, suspexit ad caelum* †. Ex quo loco necesse esse, ut in equuleo torti corpore prostrati jacerent, contendit Gallonius. At nemo non clare perspiciet, hominem eo modo, quo diximus, suspensum, aeque facile *ad caelum suspicere* posse, ac si corpore supino jaceat. Alterum testimonium ex Amm. Marcellino adducitur : *Innocentes tortoribus exposuit multos, vel sub equuleo cepit* [rectius Valesius *caput*] *incurvos, aut ictu carnificis torvi substravit* ‖. Et alibi : *Quanquam incurvus sub equuleo staret* §. Unde idem vir doctus novum quoddam et inauditum cruciandi genus excogitavit ; quasi tortores nonnunquam doloris augendi gratia, laxatis funiculis, corpus sub ventrem equulei cadere, atque ibi incurvatum pendere sinerent. Verum non *sub equuleo cecidisse* vel *pependisse* dicit Ammianus, sed *stetisse :* quod qua ratione cum Gallonii sententia convenire possit, non intelligo. Sed quia mos fuit eos, qui in equuleo torquendi erant, prius flagellis verberari, *incurvus* fortasse dixit, quod verberibus laceratus recto corpore stare amplius non potuit ; idque *sub equuleo*, hoc est, juxta equuleum ; ut cum dicitur, *sub hasta venire* * : quod de voce etiam *incurvos* in altero Ammiani exemplo pari ratione dici potest. Ni quis potius de catenis onustis, earumque pondere incurvatis, voces istas intelligere malit ; quemadmodum et in re simili scribit Paulinus Aquitanus :

Moestorum pallens infelix ordo reorum
Haerebat, nexis per squallida colla catenis,

Incutiens

* De SS. Martyr. cruciat. c. 3. † Epist. ad Innoc. 49. ‖ L. 26. c. ult. § L. 28. c. 1. * Liv. l. 5. c. 16.

Incutiens fractis ſtridentia vincula membris,
Et motans tardos, incurvo pectore, greſſus *.

Hic voces *incurvo pectore* eodem ſenſu, quo Ammianus *caput incurvos*, uſurpaſſe videtur. Nonnullos etiam ex hoc infelici ordine equuleo deſtinatos fuiſſe poſt pauca ſignificat.

Aſt alii ſurſum porrecti robora ligni,
Triſte miniſterium, furioſo corde parabant ;
Ut caro diſtentis propere, male pendula, membris
Tortori laceros crucianda exponeret artus.

Ubi etiam verba *ſurſum porrecti robora ligni*, et *caro pendula*, erectam equulei formam plane demonſtrant.

Ceterum cum neque verberibus, neque membrorum extenſione, ut rem quaeſitam confiteretur, homo tortus evinci potuit ; ignes et ardentes laminae aevis antiquioribus corpori admovebantur. Ita Fabius, rem totam ordine recitans : *Ego ſcindo veſtes, tu intremiſcis ; ego ad flagella nudo corpus, te facit pallor exanimem ; ego poſco flammas ; tu non habes in meo dolore patientiam* †. Et V. Maximus : *Rupit verbera, fidiculas laxavit, ſolvit equuleum, laminas extinxit ; priuſquam efficere potuit, ut tyrannicidii ſocios indicaret* ‖. Sequentibus autem ſeculis, cum jam ſtipitis ſpeciem equuleus receperat, hiſce omnibus torquendi modis ungulae etiam ferreae adjiciebantur, quibus latera et aliae corporis partes laniari ſolebant. Sic in Codice Juſtiniani praecipitur : *Si convictus fuerit, et ad proprium facinus detegentibus repugnaverit pernegando, ſit equuleo deditus, unguliſque ſulcantibus latera perferat poenas proprio dignas facinore* §.

Attamen quo tempore haec formae immutatio inter Romanos fieri coeperit, pro certo affirmare nequeo. Ad Fabii ſaltem aetatem, hoc eſt, imperium Domitiani, ſpeciem manſiſſe equinam eo credibile videtur, quod pater, qui in Declamatione ſupra citata ob filium a ſe tormentis occiſum defenſionem ſibi inſtituit, tanquam jacentem in cruciatibus illum deſcribit. Ratio autem mutationis ſatis, opinor, probabilis adferri poteſt. Inferioribus enim Romani imperii aetatibus non tantum Chriſtianos, ſed alios etiam eximiae dignitatis homines majeſtatis crimine poſtulatos, equuleo traditos fuiſſe ſaepius legimus. Quamdiu autem in quaeſtionibus jure conſtitutis ſolum adhibebatur, nihil amplius erat neceſſarium, quam ut ea, quae a reo dicerentur, ipſi judices, aliique quorum intereſſet, exaudire poſſent ; cui propoſito forma equina ſatis conveniebat. Poſtea vero cum crudeliſſimis iſtis tyrannis ad ſuſpicionibus ſuis indulgendum, atque Chriſtianos vexandum, hac machina abuti placuit, erecta forma ſine dubio omnium fuit commodiſſima. Nam ita crucis ſpeciem quodam modo referebat, quo major poenae eſſet ignominia ; et praeterea homo tortus oculis circumſtantium ad alios deterrendos magis exponebatur. Apud Graecos ſane, unde Romani acceperunt, figuram equinam

* De vit. B. Martini, l. 5. v. 261. † Declam. 7. ‖ L. 3. c. 3. § L. 7. de malefic.

equinam in uſu fuiſſe, cum Perilli taurus, tum etiam Zenonis hiſtoria ſupra memorata, manifeſto ſatis declarare videntur.

Verum enimvero ut diſcrimen inter has duas machinas clarius pa-
Fig. 4, 5. teſcat, ac melius inter ſe conferri poſſint, utriuſque imaginem hic conjunctim exhibebimus. [Prior forma equulei, (*Fig.* 4.) Poſterior forma equulei, (*Fig.* 5.)] Priori adſtat tortor, majoris trochleae manubrium tenens, quo hominem in dorſum equulei impoſitum extendat. Poſterior autem, quam a clariſſimi MEADII exemplari delineatam dedimus, tres humanas figuras habet adjunctas; quarum una eſt hominis in equuleo ſuſpenſi, duae reliquae ſunt tortorum. Ex his alter, chlamyde (quam veſtem tortori etiam tribuit Hieronymus*) ab laevo humero pone rejecta, dextrum equulei cornu dextra prehendit, quaſi recte aliquid compoſiturus; alter vero, utpote prioris adjutor, nudus, ac genu nixus, ad pedes torquendi hominis vinciendos ſe parat. Quod ſiniſtrum autem equulei cornu dextro ſit brevius, injuria temporis accidiſſe credamus; quia ſumma pars plane abrupta eſſe videtur. Quaedam aut ipſe artifex, aut ſaltem delineator omiſit. Etenim nec inferior pars ſtipitis, ubi conſpici poſſet, nec trochlea ad imum conſpicitur: nam alteram trochleam pone collocari ſolitam ſupra notavimus. In eo autem alteruter manifeſto erravit, quod hominem in equuleo ita conſtituerit, ut pedum digitis ſolum tangere videatur; quod neque pendenti, neque veterum teſtimoniis de hac re ſupra adductis, omnino convenit. Sed vetuſtis hujuſmodi monumentis haud raro accidere invenimus, ut partes praecipuas, et quae ſummam operis continent, artifices diligenter ac ſtudioſe effinxiſſe contenti, reliquas vel prorſus neglexerint, vel minus
Fig. 6. ſaltem accurate expreſſerint. Ceterum ne quis ea diutius fruſtra requirat, quae in exemplari deſiderantur, ſeorſim delineata oculis ſubjecimus, una cum tortore trochleam convertente. Arcus autem, qui juxta hominis ſuſpenſi caput ſiniſtrorſum conſpicitur, nihil cum equuleo habet commune; ſed oſtii alicujus partem, carceris forſan unde productus fuit, exhibet.

Jam ſi duplicem hanc equulei formam, ac ſingulas partes inter ſe conferamus, eundem plane torquendi modum ſub diverſa ſpecie utrique fuiſſe facile videbimus. Si priorem enim, ad equi imaginem factam, in altum modo erectam mente concipiamus; trochleae, fidiculae, retorſio brachiorum, et totius corporis extenſio, haud aliter atque in poſteriori conſtitui apparebunt. Praeterea nihil difficile, nihil operoſum videtur; ſed facilis et expedita cruciandi ratio nobis ſe offert, quae in publicis ſuppliciis praecipue requiritur.

At nequis poſt omnia, quae hactenus dicta ſunt, *furcam*, hoc eſt, *crucem* ad furcae imaginem factam, pro equuleo nos protuliſſe ſuſpicetur; ſciendum eſt hanc equulei ſpeciem furcae non admodum fuiſſe diſſimilem. Hoc Theophili cujuſdam verba, a Gallonio plane contra ſententiam ſuam allata, demonſtrant: *Ecce*, inquit, *modo Chriſtianus*

* Ubi ſupra.

Fig. 4.

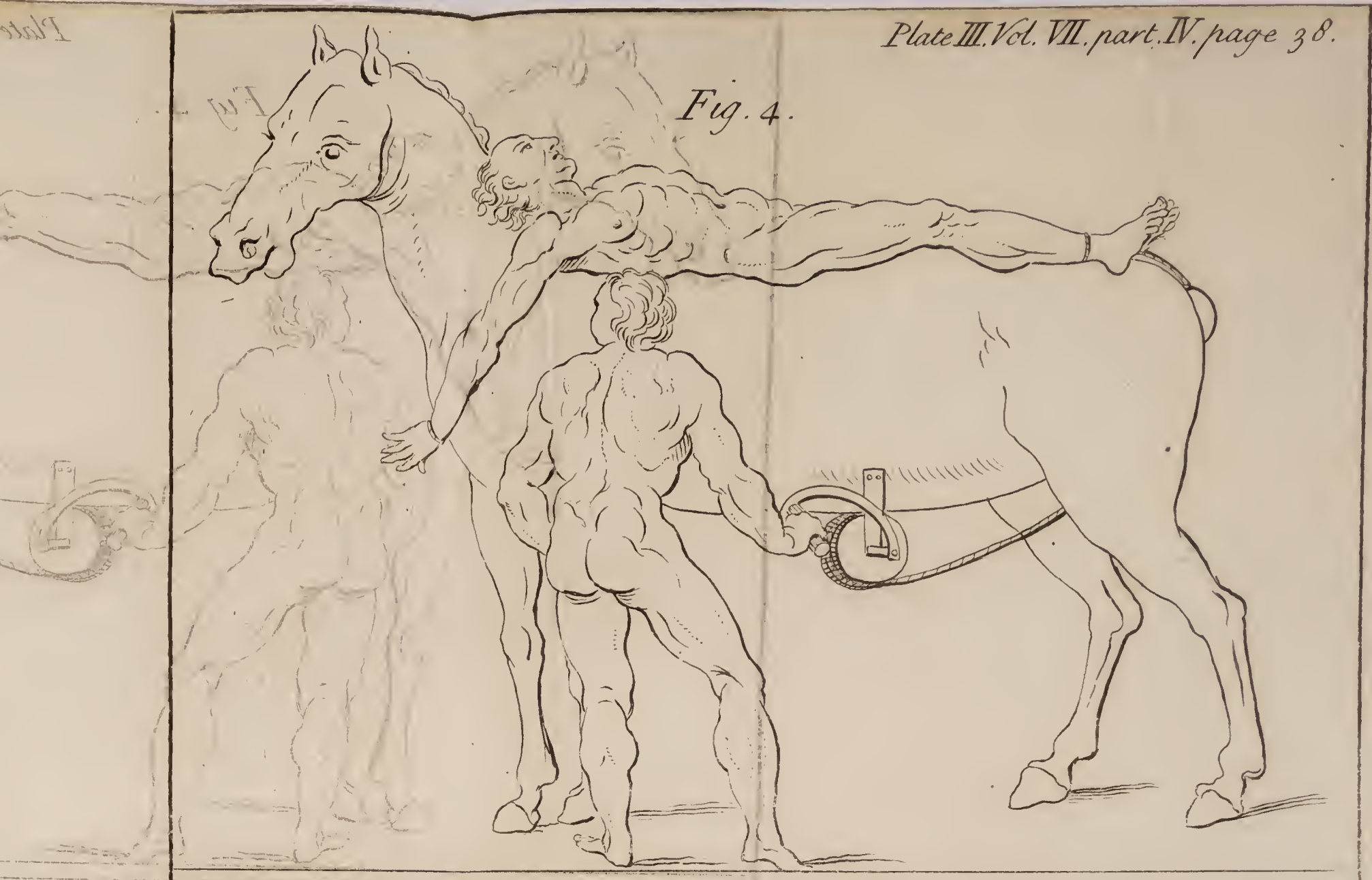


Fig. 5.

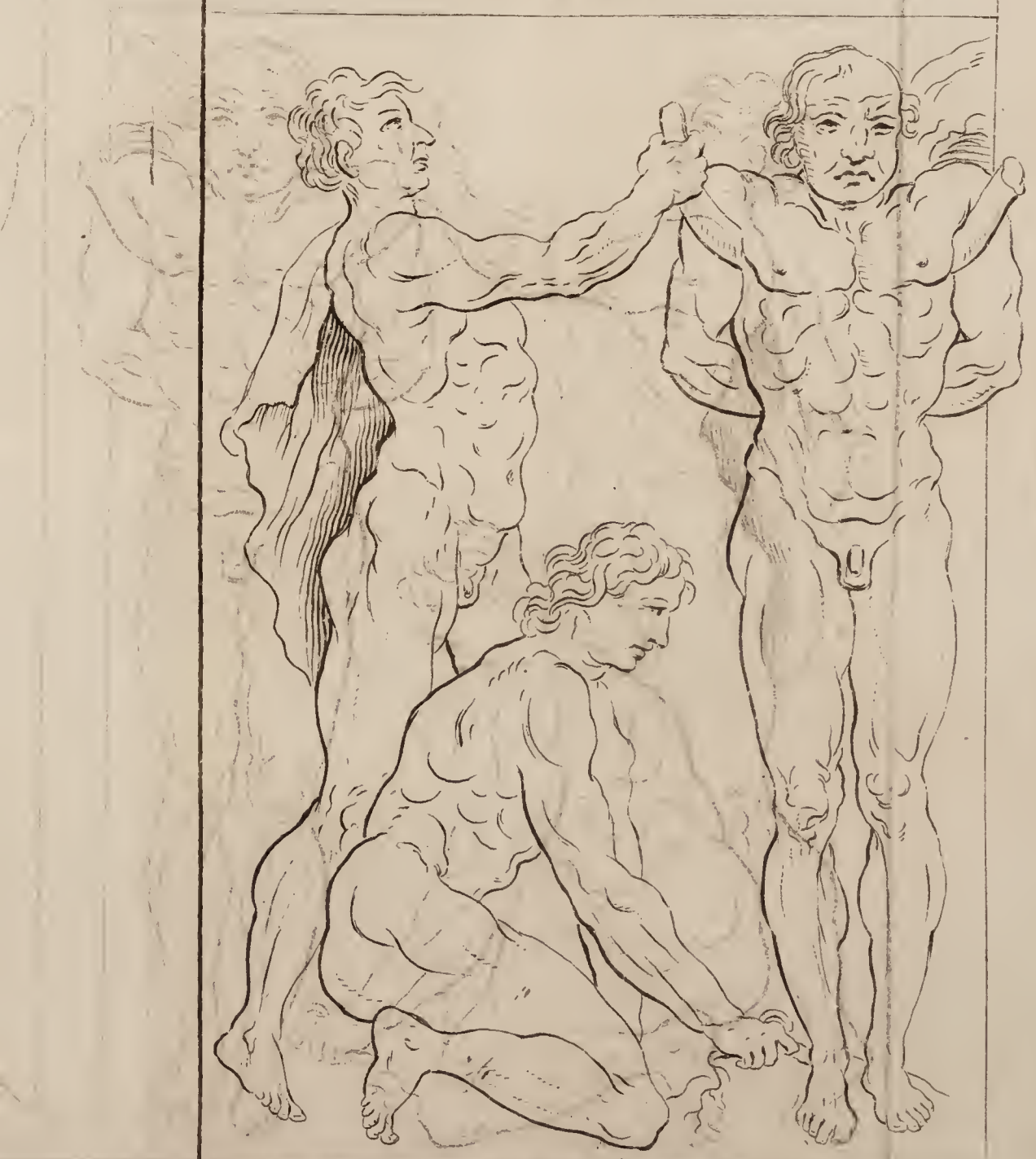


Fig. 6.

Chriſtianus ſum, quia in cruce, id eſt in equuleo, ſuſpenſus ſum. Equuleus enim crucis quandam ſimilitudinem gerit *. Nihilominus tamen furca in multis ab equuleo differebat. Primum enim ima pars cornuum ad formam V literae in acumen coibat; deinde cornua multo erant longiora; praeterea, qui in furcam agebatur, brachiis ſupra caput, non poſt tergum, retortis pendebat; denique manus haud ſtipiti conjunctae, ſed cornibus diſpanſae ligabantur, ut oſtendit Lipſius †. Et tamen alibi vir idem eruditiſſimus Auſonii verba de *Cupidine torto* cruci aſſignat ‖, quae ad equuleum omnino referri debent. Locus Auſonii ita ſe habet:

Hujus in excelſo ſuſpenſum ſtipite Amorem,
Devinctum poſt terga manus, ſubſtrictaque plantis
Vincula moerentem, nullo moderamine poenae
Adfligunt §.

Cum poeta hic ait, *devinctum poſt terga manus*, non crucem, ſed equuleum plane deſcribit. Porro cum Sulpicius Severus de B. Martino loquens ait, gloriam martyris eum adeo affectaſſe, ut, ſi licuiſſet, *equuleum ſponte aſcendiſſet* *; machinae figura ac ratio ſuſpenſionis, quemadmodum id facere potuiſſet, aperte ſatis oſtendunt: in furca autem ſe ipſum nemo ſuſpendere potuit.

In ſumma autem, cum tota hujuſce rei probatio veterum ſcriptorum teſtimoniis praecipue nitatur, ut plura adferre, quae haud parva copia ſeſe obtulerunt, ſupervacaneum duximus; ita nec pauciora ad plenam ejus explicationem ſufficere exiſtimavimus. Verum quaecunque de ea apud antiquos leguntur, uni aut alteri ſpeciei ſupra deſcriptae facile tribui poſſunt. Qui ad auctoris igitur aetatem, et diverſos loquendi modos diverſis temporibus de equuleo uſurpatos attenderit; nihil, opinor, difficultatis in poſterum inveniet, quid de hoc tormenti genere ſtatuere debeat; in quo explicando tot viri eruditi hactenus ſe fruſtra torſerunt.

VIII. The learned and judicious Author takes occaſion from ſome antique Braſs Implements found near the Wall of *Antoninus Pius*, now named *Graham*'s *Dyke*, in *Scotland*, to give us this curious Diſſertation upon the *Stylus*, an Inſtrument uſed by the Ancients for Writing, with the Figures of ſome of them annexed in a Copper Plate; two of which are repreſented in the Shape and Form of the *Roman Fibula*; but the Author is of Opinion they were deſigned for a different Purpoſe, for which he produces very cogent Reaſons.

He obſerves, that before the Uſe of Pens the Ancients performed their Writing with an Inſtrument called by them a *Stylus* or *Graphium*. The Matter of it was Gold, Silver, Braſs, Iron, or Bone; the Shape various, but alike in being pointed and ſharp at one End, and flat and broad at the other End: The firſt for writing, or rather cutting their Letters,

An Extract of a Diſſertation De Stylis Veterum, & diverſis Chartarum generibus, [*by the Hon. Sir* John Clerk, *one of the Barons of the Exchequer in* Scotland, *and F. R. S.*] *By* Roger Gale, *Eſq; V. P. and Tr. R. S.* N° 420. P. 157.

* De SS. Martyr. cruciat. c. 3. † De cruce, l. 3. c. 6. ‖ Ibid. l. 1. c. 5.
§ Idyll. 6. * Epiſt. 2.

Letters, the latter for defacing or rubbing out whatever wanted Correction; for all which, as well as for every thing elſe aſſerted by him, he produces ſufficient Proofs from proper Authors.

He informs us, that the *Styli* made of Iron, were ſometimes uſed as Daggers, and quotes two Paſſages out of *Suetonius* to prove it; one where *Julius Cæſar* is ſaid to have wounded *Caſſius* in the Arm, *Graphio*; the other, where he tells it was cuſtomary with *Caligula* to get his Enemies murdered, *Graphiis*, when they came into the Senate-Houſe, and confirms theſe two Paſſages by a third, taken from *Seneca*'s Firſt Book *De Clementia*. He ſuppoſes the *Stylus* made of Bone was for the Uſe of Women and Children, as leſs dangerous than thoſe of Metal; by a Quotation from *Prudentius*, it appears that *Caſſianus* the Martyr was killed by his Scholars with Iron *Styli*.

He agrees with *Petavius*, or his Editors, that the Implements, which gave Birth to this Diſſertation, were *Styli*, and not *Fibulæ ad connectendas veſtes*, as *Monfaucon* and other Antiquaries have imagined, and thinks an Objection that the Tongues of the *Styli* muſt have been much longer than the Tongues of their ſuppoſed *Fibulæ*, to be of little Weight; ſince there muſt have been ſome of them longer, and ſome of them ſhorter, according to the different Fancies of the Writers. Military Men might ſometimes write with the Point of their Daggers, and from this Practice the Words *Stylus* and *Pugio* came to be confounded; but Men of Buſineſs and private Perſons cannot be ſuppoſed to have made uſe of Daggers for Writing. He obſerves alſo, which is no ſmall Argument for his Side of the Queſtion, that if *Monfaucon* had conſulted the numerous Draughts he has publiſhed of the Habits belonging to the old *Greeks* and *Romans*, he would not have found one of theſe Implements, either as a Faſtening, or an Ornament upon them.

He proceeds next to a Deſcription of theſe *Styli* found in *Scotland*, and ſhews how they were accommodated to the Buſineſs he ſuppoſes them deſigned for; but as the Copper Plate prefixed to his Diſſertation will give us a much clearer Notion of that, I ſhall refer you to it, and only take Notice that the fifth Figure in it is ſo entirely different from the others, that he himſelf is in ſome Doubt about it, and owns it might have ſerved the Aruſpices, in examining the Bowels of Animals, and have been one of thoſe Inſtruments called *Exſtiſpicia*. However, he thinks that if he ſhould pronounce it to have been a *Stylus*, he ſhould not be much out of the Way, ſince the Ancients had their *Thecæ Graphiariæ*, which Name will agree very well with this Braſs Caſe, and the Inſtrument found within it. From the *Stylus* uſed to form Letters comes that figurative Expreſſion, that a Perſon writes ſuch or ſuch a ſort of a *Style*, to denote his Manner, as a *lofty Style*, or a *low Style*; which way of ſpeaking our own and other modern Nations have introduced into their Language.

As

As to the ſeveral Sorts of *Charta* uſed for Writing, he obſerves the moſt ancient were made of Barks of Trees, or Skins, or were ſuch as are called *Pugillares*. The oldeſt were of the inner Bark of Trees called *Liber* in *Latin*, whence a Book had the Name of *Liber*; but very little of this Sort is now in Being, except the *Ægyptian* Paper may be accounted one Species of it.

The *Papyrus* was called Βύβλος or Βίβλος by the *Greeks*, and thence their Books Βίβλοι or Βιβλία. This Sort of *Charta* was made of a Plant that had many pelliceous Tunicles, as *Pliny* informs us, which were ſeparated from one another by a Needle, and then glued again together, to give them a Strength and Firmneſs ſufficient to retain what might be written upon them. *Alexandria* was the Place moſt eminent for this Manufacture. There are ſome Fragments of this Sort ſtill extant in Libraries, particularly the famous Manuſcript of St. *Mark*'s Goſpel at *Venice*.

The *Chartæ Membranaceæ* are made of the Skins of Animals, dreſſed either like our Glove-Leather, or modern Parchment. The firſt Sort was commonly uſed by the *Jews* for writing the Law of *Moſes* upon it, and from the rowling up of theſe Skins comes the Word *Volumen*. But the Skins which *Varro* and *Pliny* ſay were firſt made by *Eumenes* King of *Pergamus* were in more common Uſe: However, *Eumenes*, who is related by theſe Authors to have made them in Oppoſition to *Ptolomy* King of *Ægypt*, that had forbid the Exportation of the *Papyrus* from his Dominions, does not ſeem to be the Inventor of the *Chartæ Membranaceæ*, ſince *Herodotus*, who lived long before his Time, informs us, that the *Ionians* and other Nations were uſed to write upon Goat and Sheep-Skins. *Joſephus* alſo tells us, that the *Jews* ſent their Laws written upon Skins in Letters of Gold to *Ptolomy*; by which it ſeems as if the writing upon Skins was no new thing at that Time among the *Jews*.

The Uſe of the *Pugillares* was alſo very ancient, being mentioned by *Homer*, and among the *Latins* by *Plautus*. They were made of all Sorts of Wood, Ivory, and Skins covered over with Wax. They were likewiſe of ſeveral Colours, as red, yellow, green, ſaffron, white, and others. Being waxed over, any thing was eaſily writ upon them by the Point of the *Stylus*, and as eaſily rubbed out, and altered by the flat Part of it. Sometimes theſe *Pugillares* were made of Gold, Silver, Braſs, or Lead, and then there was a Neceſſity of an Iron *Stylus* to write or cut the Letters upon them, which explains that Paſſage in the 19th Chapter of *Job*, *Quis mihi det ut exarentur in libro, Stylo ferreo & plumbi lamina, vel celte ſculpantur in Silice.* They conſiſted ſometimes of two, three, five, or more Pages, and thence were called *Duplices*, *Triplices*, *Quintuplices*, and *Multiplices*; and by the *Greeks*, Δίπλυχα, Τρίπλυχα, *&c.*

The *Diptychs* and *Triptychs* that were covered with Wax, ſerved only for common Occurrences, the other Sorts received every thing elſe

that was written upon *Chartæ* or *Membranæ*, and were ſometimes called by the *Greeks Palimpſeſtæ*, from the rubbing out of the Letters upon them.

The *Chartæ Linteæ*, and *Bombycinæ*, which were made of Linnen or Cotton, were of a much later Date; and from theſe we learned to make the Paper now in Uſe of Linnen Rags, an Invention probably of about 600 Years ſtanding.

Writing was practiſed upon all theſe *Chartæ* with a Reed, and afterwards with a Pen, except upon the *Pugillares*. Theſe Reeds grew upon the Banks of the *Nile*; the *Greeks* alſo uſed Reeds imported from *Perſia* for the ſame Purpoſe. *Calami argentei* are alſo mentioned for Writing.

Their Letters were formed with Liquors of various Colours, but chiefly black, thence called *Atramentum*, and in *Greek* μέλαν or μελάνιον. It was ſometimes made of the Blood of the *Cuttle* Fiſh, ſometimes of Soot. *Apelles* compoſed a *Black* of burnt Ivory, which was called *Elephantinum*. They had Ink alſo from *India* of an approved Compoſition, as *Pliny* ſays.

The Titles of their Chapters and Sections were written in Red or Purple: Hence the Titles of the *Roman* Laws called *Rubricæ*. Their *Purpura* was an exceeding bright Red or Crimſon, much in Vogue with the *Byzantine* Writers, and called Κιννάβαρις, which was a Liquor made of the *Murex* boiled, and its Shell very finely powdered; or, as *Pliny* relates, of the Blood of that Fiſh. Almoſt all the ancient Emperors wore this Colour, their Names were painted in it upon their Banners, and they frequently wrote with it, and wore it. This Colour was often the Diſtinction of a *Roman* Magiſtrate, and to put on the Purple was the ſame thing as to aſſume the Government. This Colour was ſo admired by the Poets, that they called every thing which was very bright and fine, Purple; as *Horace* compliments the Swan, which is never of any Colour but white, with

Purpureis ales oloribus.

We find even *Snow* honoured with the ſame Epithet, whence ſome have imagined that *purpureus* ſignifyed *white*.

The Children of the Emperors, and ſuch as had a Proſpect of riſing to the Throne, and their Guardians, ſometimes wrote with Green; Gold alſo was employed for the like Purpoſe. They that deſire to ſee more upon this Subject may have Recourſe to *Mabillon De Re Diplomatica*, and *Monfaucon* in his *Palæographia Græca*.

CHAP.

CHAP. II.

MISCELLANEOUS PAPERS.

I. ON the 22d of *March*, 172$\frac{4}{5}$, at Noon, being in the Latitude 35°, 36′ S. and Longitude 4°, 9′ W. with Variation 3°, 16′, W. we diſcovered ſeveral *Pumice-ſtones* on the Sea; but not expecting any ſuch thing at that Diſtance from the Land, (the Iſlands *Triſtan d' Acunha* being the neareſt, which I judged to bear from W. 9°, 10′, S. Diſtance 186 Leagues) we were in Diſpute what it might be; when about 1 P. M. we took up a Piece in a Bucket, (the Ship going then but 3 Knots) which confirmed my Opinion of its being *Pumice-ſtones*. Towards Night it was ſpread all round us as far as we could ſee: The Wind being variable from N. by E. to E. we ſtood to the Eaſtward: Towards Morning, the Wind veering to the Northward, we ſteered E. S. E. The *Pumice-ſtones* were very thick, in Drifts, lying N. N. E. and S. S. W. and extended out of our Sight at the Maſt's Head, encreaſing as we ran to the Eaſtward. To the 23d at Noon I made our Courſe S. 38°, 30′ E. Diſtance 76 Miles: Latitude by Obſervation 36°, 35′ S. Longitude 3°, 24′ Weſt, from the Meridian of *London*. On the 24th clear Weather and freſh Gales, variable from N. E. by N. to N. by W. with a long Swell from the Eaſtward. We continued our Courſe E. S. E. 140 Miles, the *Pumice-ſtones* being thicker; ſo that from Yeſterday Noon, till four this Morning, ſome of the Drifts were about a Cable's Length broad, and ſo thick, we could ſcarce ſee the Water between them; and there was much the ſame Breadth between the Drifts, with ſeveral *Pumice-ſtones* interſperſed. Towards Noon, I found the *Pumice* ſomewhat thinner: Latitude 37°, 35′ S. and Longitude 1°, 4′ W. On the 25th, from Noon till two this Morning, had a freſh Gale at N. and N. by E. afterwards little Wind from W. to N. W. with a N. E. Sea: we ſteered E. by S. 101 Miles. In the Evening the Drifts were near as large as above, but towards Morning decreaſed much; ſo that about Noon we were clear of theſe *Pumice-ſtones*, ſeveral of which were as big as a Man's Head. We have ſailed 317 Miles ſince we firſt diſcovered them. They lay juſt in the Track for Ships outward bound, and we have no Account of them before; but all the Ships that went out the ſame Year, and ſince, (who go ſo far to the Southward) have fallen in with them. In the Morning we tried the Current, but found none: And no Ground at 130 Fathoms. At Noon Latitude 37°, 54′ S. Longitude 0°, 38′ E. The

A ſurpriſing Shoal of Pumice-ſtones *found floating on the Sea, by Mr.* John Dove. N°. 402. p. 444.

following Evening Variation 6°, 12′ W. At Noon, I judge *Triſtan d' Acunha* then bore from us W. 3°, 39′ N. Diſtance 256 Leagues, ſuppoſing it to lie in Latitude 37°, 5′ S. and Longitude 15°, 38′ W.

An Account of the Norwegian Finns, *or* Finlanders, *by* Peter Kinck, *Eſq*;. Nº. 400. p. 357.

II. In the Kingdom of *Norway*, in thoſe Confines which border upon *Sweden*, live a Sort of People called *Finns*, whoſe Habitation is in the Woods and Foreſts, and who are ſome of them under the *Daniſh*, ſome under the *Swediſh* Juriſdiction, of whoſe Original, Nature, and Manner of Life, I ſhall give ſome Account. And

I. Of their *Original*, which was from *Swediſh Finland* Eaſtward of the Sea of *Bothnia*, from whence for Want of the Neceſſaries of Life, they formerly tranſported themſelves into *Sweden* and *Norway*, where in the Foreſts and Wilderneſſes they got Leave to build and inhabit. For the common People of *Finland* are ſtrong and hardy, and by Conſequence fruitful and long-lived. *Finland* formerly was not ſo well cultivated as at preſent it is; ſo that the Produce of the Earth was not ſufficient to ſubſiſt the Numbers of People born there; inſomuch that Abundance of them (as the *Goths* and *Vandals*) were obliged to ſeek out new Quarters: And tho' theſe People have for the moſt Part kept to their native Language, yet have they made ſeveral Alterations in their Manners and Ways of Living.

Their Language. As for their *Language*, (tho' the much greater Part of them both underſtand and ſpeak the *Norwegian* Tongue, as well as the *Swediſh*) yet they moſtly uſe their own, which has not the leaſt Affinity or Reſemblance of either the other Two. As for Example, where the *Swedes* and *Danes*, in numbering tell 1, 2, 3. *Een*, *Toe*, *Tree*, they in theirs tell *Yx*, *Kax*, *Kolime*; and as the firſt ſay, for give me Bread, *Giv mig brod*, they ſay *Alla mina leip*, &c. And when we ſtand and hear them converſe together, we are ſurprized to conceive how they underſtand each other, ſince they ſpeak ſo very low, that we can ſcarce hear them.

Their Nature. They are generally low of Stature, but ſtrong and hardy, and healthy; their Eyes are lively, their Noſes high, and their Teeth even and white, their Feet ſhort. The Women are generally ſo ſtrong of Conſtitution, that in Child-bearing they ſeldom need any Aſſiſtance, and ſoon return to the Buſineſs of the Family again, except here and there a weakly Conſtitution. They are generally ignorant and ſilly; but this muſt be attributed to the little Converſe they have with each other and the reſt of World, ſince the *Men*, whoſe Affairs call them often to traffick with their Neighbours, and in different Provinces, are of good natural Parts, ſharp, and look well to their Intereſt. They are frugal, parſimonious and humble, fearful of giving Offence, and very reſpectful to their Superiors: They will work whole Days without any Food, if they can only have Tobacco to ſmoak or chew.

Their

Their Food conſiſts chiefly in a ſort of Fiſh which they call *Oret*, and which anſwers to our Salmon-Trout; ('tis a very delicious fat Fiſh, which they catch in the Rivers that run thro' the Woods) and next to that, in Bread and Flour of *Rye*, which they ſometimes get in great Plenty, by cutting down and burning whole Foreſts, and ſowing the Ground with Rye, which ſometimes produces 30 or 40 Fold. But this Method of producing has been of late very ſtrictly forbidden, under very ſevere Penalties, by the Landlords of thoſe Foreſts, by Reaſon of the immenſe Damage it does, by the Loſs of ſo much Timber; and becauſe the Fire ſometimes lays waſte immenſe Tracts of Land: So that it is with great Difficulty extinguiſhed, burning whole Months together, to the great Detriment of Trade. They frequently uſe *Bathing*, at leaſt once a Month, thinking thereby they prevent Sickneſs, and diſſipate all Weakneſſes from the Body: And their Method of Bathing ſeems ſo very particular, as would ſcarce agree with any other Conſtitution, or meet with Approbation from Phyſicians. The Method is this: In the Middle of the Houſe (which generally conſiſts of one large Room, built all of whole Timbers laid croſs, and notched in at the Ends to let them cloſe, and then caulked with *Moſs*, as the Seams of a Ship are with *Okam*) they build an Oven with Stone without Mortar, and without a Funnel; the Smoak going out at a Hole in the Roof, which is left open while the Wood is burning in the Oven, but ſhut cloſe as ſoon as 'tis all burnt to a bright Coal, which keeps in all the Heat. When the Oven is thus made red hot, they then ſtrip, both Men and Women, without any Reſerve, and place themſelves on Benches made near the Roof on Purpoſe: Then cold Water is brought in, which from Time to Time is ſprinkled upon the Oven; from whence ariſes a thick Steam on the Bathers, which makes their Bodies ſo warm, that they ſweat very plentifully. Each Perſon has a Rod in his Hand, with which they gently beat their whole Bodies; and if they find themſelves ſo hot that they cannot well endure it, they call for cold Water, which they pour over themſelves in ſo dextrous a Manner, that it diffuſes its ſelf over their whole Bodies, and ſo cools them again. Thus when they have bathed ſufficiently, they go directly out into the Air, though in the moſt inclement Seaſon of the Year; and what is more, will roll themſelves in the Snow for a good while together, and get no Harm by ſo doing: And this Method of Bathing they make Uſe of as their ordinary Cure, when they find any Indiſpoſition of Body upon them. In the Winter, when the Ground is covered with Snow, they make uſe of a Sort of long wooden Shoe, *Inducunt ſoleas ligneas 3 vel 4 ulnas longas*, on which they go ſo ſwiftly, that in 2 Hours Time they will run 13 or 14 Miles: And as they are generally good Marksmen, with their Guns they kill abundance of wild Game, both to help to ſupport their Families, and ſell to buy themſelves Neceſſaries. They are very ignorant

Their Manner of Life.

A ſingular way of Bathing.

Remarkable Shoes.

rant of Chriſtianity, by Reaſon of their great Diſtance from any Towns; but that Misfortune the preſent King of *Denmark* has taken ſome Meaſures to remedy: Yet though they ſeem ſo ignorant and barbarous, yet 'tis very rare that any of them are guilty of any conſiderable Crime.

A Compariſon of the *Paris* Weights with the *Engliſh*, by the Rev. J. T. *Deſaguliers*, L.L.D. F. R. S. N° 366. p. 112.

III. Finding the Accounts which we have of the *French* Weights different in different Books, I ſent to a curious Gentleman for ſome *Paris* Weights, exact to the Standard Weights at the Chatelet, and found upon Tryal the *Paris* Ounce, which contains 576 of their Grains, to be equal to 476 of our Grains Troy; from which Experiment all the other Proportions may be deduced.

The *French* Pound contains 16 Ounces.
Ounce —— 8 Drams, or 576 *Paris* Grains.
Dram —— 3 Deniers.
Denier —— 24 Grains.

Of the Arcutio, by Oliver St. John, *Eſq*; F. R. S. N° 422. p. 256. Fig. 7.

IV. When I conſider how many are charged overlaid in the Bills of Mortality, I wonder that the *Arcutio's*, univerſally uſed at *Florence*, are not uſed in *England*. I here ſend you the Deſign of one, drawn in Perſpective, with the Dimenſions, which are larger than uſual.

a, The Place where the Child lies. *b*, The Head-board. *c*, The Hollows for the Nurſe's Breaſts. *d*, A Bar of Wood to lean on when ſhe ſuckles the Child. *e*, A ſmall Iron Arch to ſupport the ſaid Bar. The Length 3 Feet 2 Inches and a half. Every Nurſe in *Florence* is obliged to lay the Child in it, under Pain of Excommunication. The *Arcutio*, with the Child in it, may be ſafely laid entirely under the Bed-cloaths in the Winter, without Danger of ſmothering.

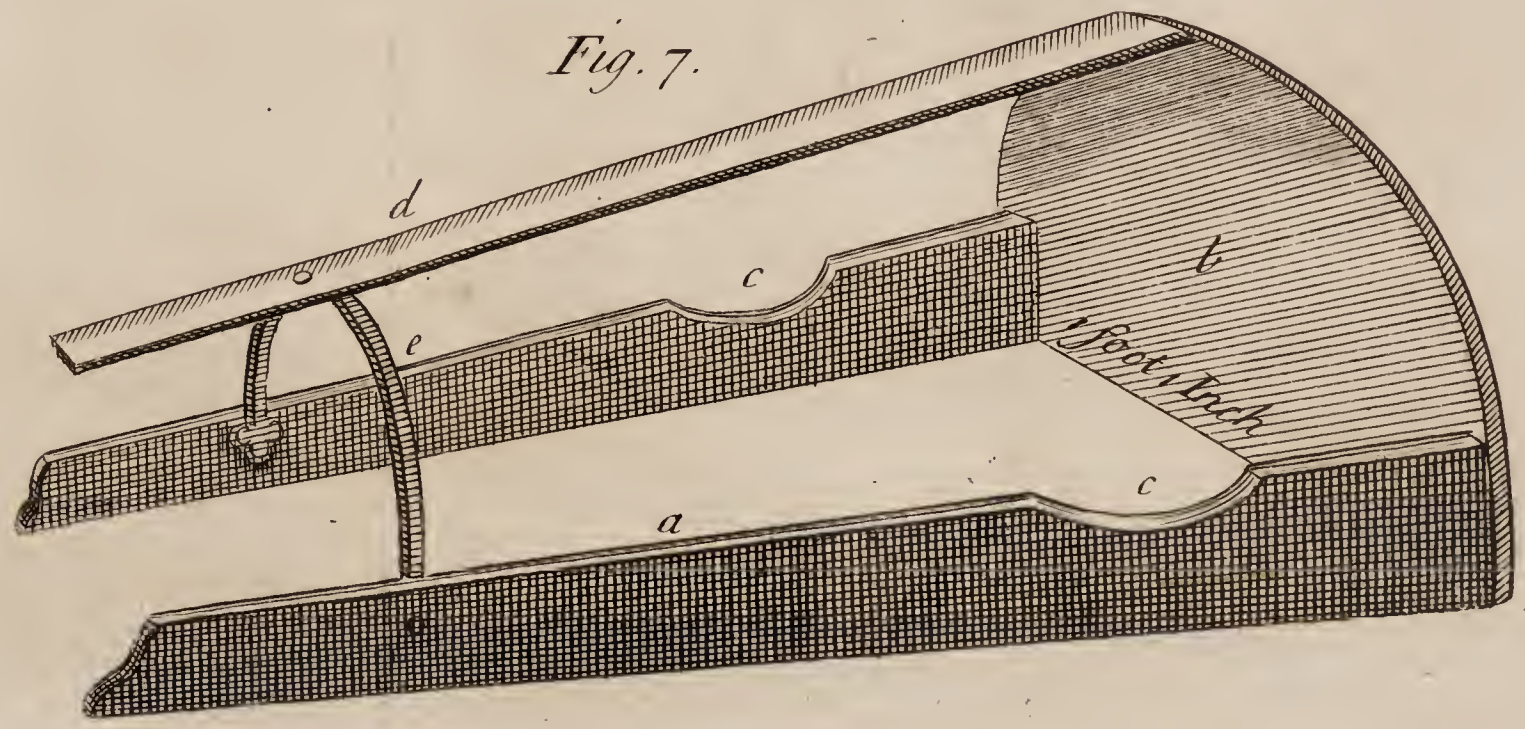
The Bills of Mortality, &c. of ſeveral conſiderable Towns in Europe. *Beginning with the Year* 1717, i. e. *from* Chriſtmas 1716, *to* Chriſtmas 1717, *Extracted from the* Acta Breſlavienſia. *By* Conr. Joach. Sprengell, M. D. F. R. S. No. 380. p. 454.

Breſlaw, *in* Sileſia,

	Buried.		*Chriſtened.*	
V. 1. In January		91	Males	584
February		113	Females	576
March		136		1160
April		108	*Among the Buried were*	
May		127	Married Men	226
June		144	Married Women	144
July		144	Widows and Widowers	157
Auguſt		208	Bachelors	60
September		128	Maidens	57
October		96	Boys and Girls under Ten Years old	419
November		113	Boys and Girls under Ten Years old	397
December only till the 24th,		77	Stillborn Boys	37
		1485	Stillborn Girls	17
				1514

N. B. Here

Fig. 7.



N. B. Here, in the Sum Total, are 29 more than in the Number of the Buried above, by Reaſon of ſeveral Stillborn Children which had no regular Burial, and ſo were not reckoned.

In the Imperial Town Vienna, *there died*,

Young People	3179
Old	2026
Total	5205, among which were,

Of 90 Years old	2	Of 99	2
91	1	100	1
92	3	102	2
93	1	103	1
94	3	104	1
95	2	115	1
96	3		

Born and Chriſtened 4030 Children.

In *Dreſden*, *Saxony*,	died	1908
	Chriſtened	1443
In *Dantzick*	died	1605
	Chriſtened	2102

In *Eſperies*, or *Eperies*, alias *Epperies*, a Town in Upper *Hungary*,

died	132
Chriſtened	157

Moſt of theſe died of the Small-Pox.

Buried.		*Chriſtened.*	
From the 25th of Dec. to the 31ſt.	21	Males	598
January	129	Females	554
February	112		1152
March	108		
April	98	*Among the Dead were,*	
May	88	Married Men	238
June	97	—— Women	141
July	86	Widows and Widowers	122
Auguſt	118	Bachelors	60
September	98	Virgins	60
October	119	Children to ten Years of Age { Boys	282
November	100	{ Girls	280
December till the 24th	81	Stillborn { Boys	47
		{ Girls	25
Total	1255		1255

In *Vienna* died	Men	1432	Women	1129
	Boys	1844	Girls	1705
	In all	6110		Amongſt

The Bills *of* Mortality *from* Chriſtmas 1717, *to* Chriſtmas 1718. BRESLAW.

Amongſt which were froze to Death in the Street	2	By taking wrong Phyſick	1
Murdered	2	Trod to Death by Horſes	4
Killed by a Waggon	2	Drowned	5
By Falls from Houſes, *&c.*	11	Beat to Death	1
Killed with Swords, Knives and Sabres	9	Smothered in a Houſe of Office	4
		Cut their Throats	2
		Killed by the Fall of Houſes	5

Among the Dead were found,

8	Perſons of 90 Years old.
7	92
2	93
3	94
3	95
1	96
2	97
2	98
2	99
1	105

Chriſtened.

Males	2185
Females	2057
Total	4242

Amongſt which were 48 Pair of Twins, and once *Tergemini.*

In *Ratiſbon* died of the *Lutherans*, 235 Perſons; amongſt which were 117 Children, 13 young Men, and 11 young Women.

An Account of ſeveral Cities in Saxony.

	Chriſtened.	*Baſtards.*	*Buried.*	*Pair Married.*	*Communicants.*
In Dreſden	1578	99	1412	501	78875
Wittemberg	286	16	317	61	13536
Leipzick	861	68	953	303	
Torgau	136	9	148	54	7917
Freyberg	340	13	373	104	24098
Stolberg	88		112	27	7314
Pulſnitz	73		75	39	4381
Konigsbruck	67		95	16	3351
Elſtra	63		45	11	3021
Bautzen	207	5	135	55	14520
Annaberg	146	19	112	37	8426
Chemnitz	173	4	166	38	10690
Oſchatz	103	3	82	20	5169
Altenburg	141		248	57	12901
Eulenberg	96	5	86	41	6194
Pirna	138	2	133	43	9164
Marienberg	91		194	18	5903
Georgenſtad	182		191	36	3580
Harta, *near* Waldheim	40	3	20	29	3291

N° *Years*

N° *Years.*	*Pair Married.*	*Chriſten'd*	*Baſtards.*	*Buried.*	*Communicants.*
1617	89	539	4	430	10530
18	122	423	10	384	9631
19	124	495	13	371	9789
20	97	428	10	451	10093
21	106	430	6	507	9676
22	110	380	7	517	9536
23	100	357	8	589	9206
24	96	383	4	417	9509
25	98	375	7	454	10058
26	78	381	6	549	11642
27	108	372	7	331	11027
28	82	371	4	318	10745
29	87	412	19	536	11531
30	80	330	7	1114	11180
1631	135	353	4	284	10524
32	88	425	5	1343	11326
33	174	163	4	879	9131
34	170	375	1	175	7447
35	87	285	9	231	7323
36	61	299	11	181	7590
37	68	386	3	383	7723
38	53	262	9	151	7682
39	45	292	4	354	9609
40	65	268	6	173	7594
1641	61	226	2	163	7562
42	48	309	4	193	8128
43	60	383	7	340	7770
44	65	231	7	156	7699
45	62	196	5	163	7050
46	57	230	6	187	7263
47	59	201	2	136	7173
48	59	197	1	182	7698
49	44	222	5	201	7739
50	65	199	1	162	7639
1651	65	232	1	168	8148
52	50	190	2	202	7948
53	62	208	2	215	8342
54	62	234	3	211	8648
55	73	202	1	194	6351
56	60	237	5	151	8493
57	58	230		174	8730
58	61	198	4	184	8561

A List *from the Year* 1617, *to* 1717 *inclusive, in the Electoral City of* Freyberg, *a famous and pleaſant Town, near the Banks of the* Molde *in* Saxony. *Lat.* 51. *Long.* 32, 43. *about* 8 *Miles* S. W. *from* Dreſden.

N° *Years.*	*Pair Married.*	*Christen'd.*	*Baſtards.*	*Buried.*	*Communicants.*
59	57	251	3	177	8431
60	66	230		240	8856
1661	47	225	3	217	8962
62	53	203	2	206	9423
63	47	206	2	247	9264
64	48	219	2	179	9279
65	61	213		207	9406
66	65	218	4	216	9979
67	79	223		306	9448
68	63	228	5	232	9588
69	55	232		204	9572
70	70	218	4	206	9564
1671	65	237	3	291	10080
72	64	207	2	286	9221
73	69	234	1	215	9912
74	55	228		204	9678
75	60	233	1	246	10093
76	58	226	1	277	9956
77	80	240	3	296	10462
78	70	256	4	302	10422
79	91	225	4	254	10356
80	63	292	4	267	11349
1681	87	285	5	218	11043
82	69	282	7	253	10894
83	77	315	8	333	11054
84	78	334	6	314	10623
85	73	249	4	251	11070
86	73	282	5	243	11488
87	80	327	6	292	11542
88	88	308	11	234	11300
89	59	276	4	301	11393
90	72	290	5	310	11380
1691	72	269	6	289	11724
92	58	284	7	296	12679
93	72	316	10	253	11597
94	65	236	7	355	12533
95	57	239	6	339	13196
96	85	277	10	290	14900
97	76	216	4	180	15619
98	73	274	7	218	15677
99	64	264	5	258	16155
1700	74	251	7	310	18569

N°. *Years.*	*Pair Married.*	*Chriſten'd.*	*Baſtards.*	*Buried.*	*Communicants.*
1701	81	283	10	188	19282
2	88	272	2	239	20383
3	95	271	6	241	20494
4	88	319	11	273	20837
5	72	295	12	357	20743
6	85	332	10	245	21813
7	82	310	18	378	21367
8	83	310	17	288	21838
9	71	302	10	305	21708
10	83	313	15	283	21699
1711	81	327	8	311	22334
12	82	310	9	325	22837
13	87	308	9	340	23627
14	70	349	6	237	23470
15	82	323	8	283	23273
16	105	317	14	361	23371
17	79	373	13	325	23904
Total	7546	28851	582	30295	1211761

Here is to be obſerved, That in the Years 1625, 26, 27, 32, and 33, the Plague raged very much; as alſo, that in the Year 1630, there died of the Plague meerly, 764. and in 1680, 103. Beſides that, amongſt the Chriſtened in 1713, a Girl was baptized, which was born and bred in *Turkey*, but from *Chriſtian* Parents. But, in general, it may be obſerved, That this Place was more populous before the War than it is at preſent; though in this Century it cannot but very much recover and increaſe.

In the Kingdom of Pruſſia.

Year.	*Born.*	*Pair Married.*	*Buried.*
1715	19606	4571	12000
16	20669	4530	12155
17	21443	4743	12301
18	20994	4287	11047
Sum	82712	18131	47503

In the Electorate of Brandenburg.

Year.	*Born.*	*Pair Married.*	*Buried.*
1715	14820	4368	11663
16	15758	4995	13149
17	16636	4539	10805
18	17319	4657	12891
Sum	64533	18559	48508

In the Newmark.

	Born.	*Pair Married.*	*Buried.*
——	5487	1683	4757
——	4973	2010	4502
——	7052	1850	4673
——	6684	1882	5069
	24196	7425	19001

In the Dutchy of Magdeburg.

Year.	*Born.*	*Pair Married.*	*Buried.*
1715	7185	2064	4982
16	7225	2186	5602
17	8746	2306	6291
18	8325	1934	5744
Sum	31481	8490	22619

The Dutchy of Cleve.

	Born.	*Pair Married.*	*Buried.*
——	6772	1964	5066
——	7313	2001	6221
——	7582	2051	6055
——	7542	1891	5865
Sum	29209	7907	23207

The Dutchy of Pomerania.

1715	7243	2190	5373
16	7386	2407	5557
17	8196	2108	5020
18	7896	2138	6231
Sum	30721	8843	22181

The Principality of Halberſtad.

——	2371	710	1834
——	2567	759	2542
——	2759	764	1961
——	2527	715	2022
Sum	10224	2948	8359

The County of Hohenſtein.

1715	528	164	406
16	639	155	444
17	644	148	449
18	612	158	416
Sum	2423	625	1715

The Principality of Minden.

——	1711	579	1618
——	1788	564	1829
——	1991	542	1419
——	1832	552	1486
Sum	7322	2237	6352

The City of Meurs.

1715	406	151	386
16	439	161	331
17	454	166	281
18	470	170	368
Sum	1769	648	1366

In Geldern.

——	——	——	——
——	——	——	——
——	1990	497	1066
——	2053	489	1064
Sum	4043	986	2130

The County of Ravenſberg.

1715	2188	679	1987
16	2410	716	2349
17	2312	672	1817
18	2344	641	1951
Sum	9254	2708	8104

The County of Tecklenberg.

——	342	153	513
——	553	163	543
——	505	186	370
——	507	135	387
Sum	1907	637	1813

The

The County of Lingen.

Year.	*Born.*	*Pair Married.*	*Buried*
1715	628	213	484
16	699	154	638
17	697	248	449
18	706	221	840
Sum	2730	836	2411

In Lauenburg *and* Butow.

Year.	*Born.*	*Pair Married.*	*Buried.*
——	585	144	362
——	587	169	420
——	586	118	366
——	554	153	321
Sum	2312	584	1469

In the French *Colonies.*

Year.	*Born.*	*Pair Married.*	*Buried.*
1715	——	——	——
16	——	——	——
17	607	181	564
18	603	136	639
Sum	1210	317	1203

The Sum Total of all that were Born in 4 Years 306046
— — — — Of all that were Married 81881
— — — — Of all that were Buried 217941
More Born than Buried, in Number, 88105

Here is alſo to be obſerved, that in the Year 1718, there died 84 Perſons above 91 Years old, and 32 above 100; and 1 died in the 116th Year of his Age. Beſides in that very Year are reckoned 2088 Baſtards.

A particular Liſt of ſeveral Borough Towns in the Kingdom of Pruſſia, *received from the* Chancery *of* Koningſberg, *of all that died in the Year*, 1718.

In the Borough of	*Died.*
— Brandenburg	581
— Schacken	346
— Fiſhauſen	312
— Taxium	456
— Balga	392
— Preuſs Eylau	319
— Bartenſtein	167
— Barthen	185
— Oſterode *and* Hohenſtein	277
— Seheſten	159
— Neudenburg *and* Saldau	330
— Lyck	141
— Oletzko	188
— Angerburg	182
— Rhein	107
— Orſelſburg	220
— Johanniſburg	141
— Lotzen	137
— Neuhauſen	148
— Labiau	249
— Raſtenburg	275
— Preuſs Holland	264
— Marungen *and* Liebſtadt	206
— Marienwerder *and* Rieſenburg	393
— Preuſs Marck	312
— Tilſit	529
— Ragnit	381
— Inſterburg, — Georgenburg, — Salau	808
— Mummel	556
— Schonberg	126
— Gerdauen *and* Nordenburg	269
— Gilgenburg	109
— Teutſch Eylau	41
— Neuhaff	15
In the three Cities of Koningſberg	1756
Sum	11077

In all theſe forementioned Places were Chriſtened 20994
Pair Married 4287

In

In *Dantzick* in	*Died.*	*Chriſtened.*	*Married.*
the Year 1718.	1579	1470	446 Pair.
In *Epperies.*	123	173	

In the Royal Hoſpital at *Liſbon* out of 1251 Foundlings maintained by the King, without knowing their Parents, there died 469, remained 782.

Continued by the ſame. N°. 381. p. 25. *A Liſt of thoſe that were Born and Buried in* Breſlaw, *from* Dec. 25, 1719. *to* Dec. 24, 1720.

Buried.

2. From Dec. 25, to the 31ſt,	40
In January	160
February	107
March	139
April	192
May	158
June	120
July	131
Auguſt	182
September	189
October	130
November	132
Dec. only till the 24th	127
	1816

Chriſtened.

Males	564
Females	556
	1120

Married 460 Pair

Among the Dead were

Married Men	385
Married Women	186
Widows and Widowers	285
Bachelors	113
Maidens	113
Children to ten Years of Age { Boys	345
Children to ten Years of Age { Girls	300
Stilborn { Boys	53
Stilborn { Girls	30
	1810

In 1720. *In* Lignitz *were*

Married	92 Pair.
Chriſtened	283
Buried	366

Among which were 149 Children.

In Jauer.

Chriſtened of *Proteſtants*	100 Ch.
Buried	175

In Oels.

Chriſtened	180
Buried	203

In Schweidnitz.

Married	218 Pair.
Chriſtened	920
Buried	250

In Vienna.

From *Jan.* 1. to *Dec.* 31.

Buried	6825
Chriſtened	4126

In Lobau.

Married	58 Pair.
Born	160
Buried	355

Amongſt which were Born 80 Boys and 80 Girls: Buried 95 Men and 48 Women, beſides 4 who died in Childbed; 26 Bachelors and 22 Maidens: 36 Boys and 42 Girls: 25 Chriſoms: 7 Stilborn: 55 Widows and Widowers. Likewiſe 51 Perſons between 60 and 70 Years of Age: 29 between 70 and 80: 7 betwixt 80 and 90: 1 of 90, and one of 99.

In

In Dresden.

Married 368 Pair.
Born 1448
Among which were 719 Boys, and 641 Girls, legitimate: Illegitimate Boys 44 and Girls 44.
Buried 1733
Amongst which were 255 married Men and 182 married Women, 189 Widowers and Widows: 88 young Men and 84 young or single Women: 883 Children, *viz.* 461 Boys and 422 Girls, amongst which were Stilborn 72, *viz.* 37 Boys and 35 Girls.

In John-George *City.*

Married 24
Christened 148
i. e. 79 Boys and 69 Girls, among which were 2 Stilborn, and 10 Bastards.
Buried 243
viz. 37 married Men and 18 married Women: 5 Widowers and 37 Widows, 6 Bachelors, and 18 Maidens: 64 Boys, 58 Girls, *&c.*

In St. Annaberg.

Married 18 Pair.
Born 105
i. e. 63 Boys and 42 Girls, among which were two Pair of Twins, and 4 Bastards.
Buried 180
viz. 96 Men and 84 Women: among which were 34 married Men and 18 married Women, 1 in Childbed; 12 Widowers and 28 Widows: 12 Bachelors, and 17 Maidens: 38 Boys and 20 Girls, among which was 1 dead born.

In Schneeberg.

Married 12 Pair.
Born 89
As 44 Boys: 45 Girls; among which were 4 Stilborn, and 3 Bastards.
Buried. 157
viz. 28 married Men, and 11 married Women: 1 Childbed Woman: 5 Widowers and 25 Widows: 9 Bachelors and 10 Maidens: 68 Children, *viz.* 49 Boys and 19 Girls.

In Leipsic.

Married 314 Pair.
Born 790, *viz.* 405 Boys and 385 Girls.
Buried 1264
Among which were 233 Men and 146 Women: 86 Bachelors, and 62 Maidens: 233 Boys and 195 Girls: 9 Women in Childbed: 98 Chrisoms, *i. e.* 53 Boys and 45 Girls: 58 Stilborn, as 36 Boys and 22 Girls.

In Berlin.

Married 669 Pair.
Born 2276
Buried 2426

In Wismar.

Christened 168
Buried 100

In Epperies.

Born 171
Buried 116

In Rawitz.

Born 134
And just as many Males as Females, except two Pair of Twins.
Buried 95

Among

Among which were 15 Child-bed Women and 3 Stilborn.

In Dantzig.

Born 1862
Buried 1610
Married 442 Pair.

This is merely of the City, and not of the Suburbs of *Dantzig*.

A List of the several Cities and Towns of the Kingdom of Prussia.

In 1720.	*Christened.*	*Pair Marr.*	*Buried.*
In Angerberg	535	88	259
Balga	638	133	395
Bartenstein	224	63	188
Barthen	337	66	246
Brandenburg	936	213	576
Teutsch-Eulau	100	25	82
Fishausen	478	103	270
Gerdauen	489	98	206
Gilgenburg	225	56	137
Insterburg	2386	336	1398
Johannisburg	378	68	188
Labiau	616	92	273
Liebstadt	440	73	343
Lotzen	256	45	148
Luck	364	65	174
Marienwerder	769	145	641
Mummel	953	168	448
Neydenburg	512	104	437
Neuhausen	243	62	141
Neuhoff	28	6	10
Oletzko	688	111	261
Ortelsburg	476	82	330
Osterode	784	92	300
Preuss Eulau	479	112	282
—— Marck	705	130	478
—— Holland	705	125	557
Ragnit	930	93	516
Rastenburg	610	155	452
Rhein	482	89	193
Schacken	576	96	259
Schonberg	276	51	230
Sehesten	354	62	181
Taxium	876	157	441
Tilsit	1139	187	647
The City of Koningsberg	1682	474	1402

Of the Year 1721. *In* Breslaw.

Buried.	
From the 25th of *Dec.* to the 31th, 1720.	38
January 1721,	123
February	129
March	161
April	127
May	149
June	132
July	86
August	103
September	125
October	99
November	121
December, till the 24th,	89
Total	1482

Christened.		
Males		610
Females		585
Total		1195
Married		405 Pair.
Among the Dead were		
Married Men		301
—— Women		157
Widows and Widowers		208
Bachelors		92
Maidens		82
Children to ten Years of Age	Boys	324
	Girls	248
Stilborn	Boys	42
	Girls	28
Total		1482

In

In *Jauer.*

Buried 114. Chriſtened 124.

In *Vienna.*

Buried 6490. Chriſtened 4104.

So that there died 2386 more than were Chriſtened.

Among the Dead were 43 *Caſualties.*

Beſides 8	Perſons of 90	Beſides 3	Perſons of 96
1	91	1	98
2	92	4	99
3	93	2	100
3	94	1	105

In *Dreſden.*

Buried 1850. Chriſtened 1396. Married 404 Pair.

Amongſt the Buried were		Girls	400
Married Men	274	Stilborn { Males	50
—— Women	206	Stilborn { Females	28
Widowers	42	*Among the Baptized were.*	
Widows	238	Boys	701
Bachelors	128	Girls	690
Maidens	93	Baſtards { Males	40
Boys	479	Baſtards { Females	51

In *L E I P Z I G.*

	Buried.							*Chryſoms.*		*Stilborn.*				*Chriſtened.*			
	Married Men.	*Married Women.*	*Bachelors.*	*Maidens.*	*Boys.*	*Girls.*	*Childbed Women.*	*Males.*	*Females.*	*Males.*	*Females.*	*Widowers & Wid.*	*Summa.*	*Males.*	*Females.*	*Total.*	*Pair Married.*
Jan.	28	25	13	11	15	14	1	1	1	2	3	20	134	43	31	74	13
Feb.	17	12	15	9	16	10	2	4	3	7	2	17	114	31	23	54	30
Mar.	28	29	13	12	14	15	0	1	3	3	3	17	138	34	31	65	1
Apr.	31	24	9	10	17	22	2	2	3	2	0	13	135	32	38	70	
May	25	23	10	9	23	16	3	6	5	0	0	16	136	31	22	53	20
June	28	16	17	4	15	13	2	3	6	2	2	12	120	21	31	52	24

July	7	10	7	5	8	12	2	1	4	0	3	15	74		37	26	63	21
Aug.	14	8	6	6	19	11	3	2	3	3	2	9	86		27	38	65	17
Sept.	14	14	1	2	13	18	2	4	4	1	1	7	81		29	46	75	30
Oct.	17	10	4	7	14	20	6	7	2	7	4	5	103		38	33	71	20
Nov.	12	13	3	6	20	7	1	3	7	2	0	11	85		37	34	71	52
Dec.	16	12	2	12	19	17	10	3	3	2	1	7	94		27	20	47	1
Sum.	237	196	100	93	193	175	24	37	44	31	21	149	1300		387	373	760	268

So that in this Year there died 1300. Born and Chriſtened 760. Hence there are 540 fewer born than died.

Among the Dead were
218 from 60 to 69 Years
82 70 79 old.
16 80 88
2 90 91
Beſides 1 Bachelor of 60, and 2 of 61; and 5 Maidens of 60, 62. 66, 70, and 73 Years old.

Among the Chriſtened were
8 Poſthumous:
14 Twins:
63 Baſtards:
And 2 *Jews* baptized.

In the Marck. Chriſtened 16086 Amongſt which were 596 Baſtards.
Married 4613 Pair.
Buried 13511

More born 2575 than buried.
Among the Buried were 28 Perſons of 90 Years old and upwards, beſides 3 of 100, 1 of 101, 1 of 102, 2 of 104, 2 of 107, and 1 of 112 Years.

In the whole Royal Pruſſia. Born 75275. Buried 58017. That there are more Born 17258 than Buried.

The Special Liſt of the Kingdom of Pruſſia.

	Chriſtened.	*Pair Marr.*	*Buried.*		*Chriſtened.*	*Pair Marr.*	*Buried.*
In Angerberg	518	104	282	Lotzen	247	68	180
Balga	605	168	381	Lyck	352	96	183
Bartenſtein.	278	65	218	Marienwerder	765	162	400
Barhrten	357	64	208	Mummel	914	193	522
Brandenburg	944	222	695	Neydenburg	545	121	326
Dutch-Elau	103	20	78	Neuhauſen	234	59	138
Fiſhauſen	498	112	300	Neuhoff	34	10	40
Gerdauen	490	75	219	Oletzko	631	103	312
Gilgenburg	110	37	76	Ortelsburg	497	92	282
Inſterburg	2235	359	889	Oſterode	369	144	183
Johannisburg	463	76	174	Preuſs Eylau	503	113	428
Labiau	569	92	277	—Holland	605	166	376
Liebſtadt	431	94	252	—Marck	657	134	335

Rangnit

	Christened.	*Pair Marr.*	*Buried.*
Rangnit	791	95	336
Raſtenburg	738	165	537
Rhein	416	108	211
Schacken	514	87	326
Schonberg	255	61	147
Scheſten	330	80	233
Taxium	870	159	508
Tilſit	1245	185	584
The Cities of Koningsberg	1655	424	1776
Total	20768	4313	12412

Chriſtened Males 130
Females 120

Total 250

In Ratisbon.

Amongſt which were 3 Pair of Twins, *viz.* 2 Boys and 4 Girls. Beſides 6 Baſtards, *i. e.* 3 Boys and 3 Girls.

Buried 220, *viz.* Married Men 41. Married Women 43. Young Men 11, Young Women 15. Children 110. *i. e.* 67 Boys and 43 Girls. Amongſt which, Widows 23. Lying-inn Women 2. Stilborn 2. Married 67 Pair.

Buried.

Married Men	234
—— Women	257
Bachelors	48
Maidens	73
Boys	232
Girls	191
Stilborn	18
In the Suburbs	10
Total	1063

Chriſtened.

Males	541
Females	543
Total	1084

Twenty-one more born than died, among the Chriſtened were 16 Pair of Twins.

In Nurnburg.

Born 2630. Buried 2247.

In Copenhagen.

The following Liſt contains ſeven Years.

In Amſterdam.

Anno	1715	died 7633 Perſons.		19	9726 Perſons.
	16	7078		20	7820
	17	7451		21	7632
	18	8644			

Born 214. Buried 142.

In Epperies.

Born 1833. Buried 1435. Married 457 Pair.

In Dantzick.

Continued by the ſame, for 1722, and 1723. N°. 400. p. 365. A Liſt of thoſe that were born and buried, &c. in Breſlaw, *&c. in the Year* 1722.

Buried.

3. From the 25th of Dec. to the 31ſt, 1721.	35
January, 1722.	100
February	94
March	129
April	121
May	122
June	182
July	185
Auguſt	203
September	167
October	173
November	190
December, 'till the 24th	90
	1791

Chriſtened.

Males	665
Females	670
	1335

Married 424 *Pair.*

Among the Dead were

Married Men		231
Married Women		149
Widows and Widowers		150
Bachelors		57
Maidens		52
Children to 10 Years of Age	Boys	570
	Girls	499
Stilborn	Boys	53
	Girls	30
		1791

In Vienna.

Buried,

Men,	1038
Women,	942
Boys,	1551
Girls,	1430
	4961

Among which was, 1 of 105, 1 of 110, and another of 111 Years of Age.

Chriſtened.

Children 4417

In Dreſden. Buried 1519. Chriſtened 1514. Married 451 Pair.

In Leipſig.

	Buried.						*Chry-ſoms.*	*Stil-born.*			*Chriſtened.*					
	Married Men.	*Married Women.*	*Bachelors.*	*Maidens.*	*Boys.*	*Girls.*	*Childbed-Women.*	*Males.*	*Females*	*Males.*	*Females.*	*Widowers and Widows.*	*Summa.*	*Males.*	*Females.*	*Total.*	*Pairs Married.*
Jan.	13	6	9	4	20	23	3	4	0	5	3	11	101	44	21	65	25
Feb.	17	11	11	8	14	7	0	3	3	4	2	13	93	30	26	56	21
Mar.	10	6	3	4	21	11	3	9	1	6	2	8	34	36	31	67	29
Apr.	19	9	4	10	17	8	1	3	3	1	2	15	92	39	28	67	0

May

May	19	13	13	2	20	14	2	5	2	2	4	15	111	39	41	80	53
June	11	7	4	2	22	26	0	4	2	5	5	1	89	40	35	75	23
July	11	8	4	2	24	22	3	4	3	1	2	3	87	40	39	79	55
Aug.	8	5	6	8	16	9	1	4	3	2	4	2	68	40	34	74	27
Sept.	8	3	1	1	19	14	1	3	2	1	2	6	61	34	43	77	22
Oct.	6	9	4	5	12	8	1	6	1	3	6	4	65	49	30	79	24
Nov.	11	7	3	3	10	14	1	7	0	1	2	5	64	33	38	71	76
Dec.	11	7	4	4	19	13	0	6	3	4	2	6	79	39	39	78	6
Summa	144	91	66	53	214	169	16	58	23	35	36	89	994	463	405	868	361

So that in this Year there died 994, and Chriſtened 868. Hence there are 126 fewer born than died.

Among the Chriſtened were 2 Poſthumous, 12 Twins, 99 Baſtards, 1 Foundling.

Among the Dead were

78 from 60 to 69 Years old,
50 70 79
15 80 98

Buried 143, Chriſtened 190. Among the latter were 107 Boys and 83 Girls, and among theſe were 6 Twins and 1 Baſtard. 73 Pair were Married. *In* Weimar.

Buried 2499, Chriſtened 2701. Among which were 260 Baſtards. Married 742 Pair. So that there were 202 more Born than Buried. *In* Berlin.

	Chriſtened.	*Pair Marr.*	*Buried.*
In Angerberg	565	92	212
Balga	604	145	400
Bartenſtein	268	42	124
Barthen	309	97	170
Brandenburg	937	223	546
Dutch-Elau	157	20	54
Fiſhauſen	473	105	405
Gerdauen	545	92	187
Gilgenburg	205	63	98
Inſterburg	2047	381	1013
Johannisburg	382	68	191
Labiau	608	99	280
Liebſtadt	443	76	179
Lotzen	263	57	110
Lyck	360	93	119
Marienwerder	791	185	398
Mummel	913	225	521
Neydenburg	674	153	301
Neuhauſen	217	62	141
Neuhoff	37	2	25
Oletzko	726	123	270
Ortelsburg	501	91	260
Oſterode	506	97	207
Preuſs Elau	490	96	276
—— Holland	666	147	334
—— Marck	142	170	287
Ragnit	803	109	371
Raſtenburg	553	118	301
Rein	551	81	174
Schacken	524	130	390
Schonberg	279	66	114
Seheſten	356	76	137
Tapiau	846	176	401
Tilſit	1267	218	632
The Cities of Koningsberg	1664	442	1688
Total	20672	4420	11316

The Special List *of the Kingdom of* Pruſſia.

In

In *Cuhrmarck Brandenburg*	18334	4732	11602
Neumarck	7509	1705	4047
The Dukedom of *Magdeburg*	8402	2264	6006
Of *Cleve* and *Mark*	6921	1886	5740
Pomerania	7256	1858	4424
Halberſtadt	2899	724	2040
Hohenſtein	589	151	403
Minden	2140	479	1351
Ravensberg	2270	605	1600
Moers	491	160	369
Geldern	1686	447	1449
Tecklenburgh	579	118	398
Lingen	729	242	529
Lauenberg and *Butow*	630	156	372
French Colonies	663	130	572
Of all the King of *Pruſſia*'s Dominions } Summa	81770	20077	52218

So that there were 29552 more Chriſtened than Buried. Among the Dead were 71 above 90 and 100 Years of Age; and 1 of 120.

In Nurenberg

Buried.		*Born.*	
Married Men	194	Males	501
—— Women	233	Females	554
Bachelors	42		
Maidens	61	*Summa*	1055
Boys	285		
Girls	230		
Stilborn	12	Among which were 12 Twins.	
Summa	1057		

In Copenhagen.

Born.		*Married.*	*Buried.*
Males	1345	785 Pair	1999
Females	1256		
	2601		

So that there were 602 more Born than Buried.

In *Amſterdam Died* 8421

In *Epperies* were Born 213. Buried 135.
In *Dantzig* were Born 2092. Married 490 Pair. Buried 1442.
In *Rawitz* were Born 200. Buried 74.

From

Buried.		*Christened.*		
From the 25th of Dec. to the 31st, 1722.	22	Males.		711
January, 1723.	118	Females		684
February	114			1395
March	122	*Married 422 Pair.*		
April	102	Among the Dead were		
May	115	Married Men		220
June	119	Married Women		118
July	93	Widows and Widowers		150
Auguſt	124	Bachelors		48
September	124	Maidens		46
October	85	Children to 10 Years of Age	Boys	369
November	114		Girls	306
December, 'till the 24th	69	Stilborn	Boys	38
			Girls	26
	1321			1321

The Bills of Mortality of 1723. *In* Breſlaw.

Buried 5443. Among which were 1079 Men, and 974 Women, 1758 Boys, and 1632 Girls. Chriſtened 4457. *In* Vienna.

Buried 171. Chriſtened 226, and 70 Pair Married. *In* Lobau.

Buried 321. Chriſtened 362. *In* Freyberg.

Buried 1654. That is, 165 Married Men, 136 Married Women, 36 Widowers, and 138 Widows, 68 Bachelors, 64 Maidens, 580 Boys, and 467 Girls. *In* Dreſden.

Stilborn, Boys 54 and Girls 46. Chriſtened 1510. That is, 756 Boys and 754 Girls. Among which were Baſtards 66 Boys and 41 Girls. Married were 396 Pair.

Buried 928. Among which were 126 Married Men and 88 Married Women, 53 Bachelors and 36 Maidens, 199 Boys and 164 Girls, 21 Women in Childbed, Newborn Boys 60, and Girls 46, beſides Stilborn Boys 37, and Girls 30; alſo 68 Widows and Widowers. Chriſtened were 966; as 489 Boys and 477 Girls. Among which were 11 Pair of Twins and 99 Baſtards. Married have been 306 Pair. *In* Leipſig.

Buried 448. Chriſtened 666. *In* Erfurt.

In the Elector of *Mentz*'s Dominion, in 75 Villages are Buried 543, Chriſtened 872.

Buried 2618. Chriſtned 2770. Among which are 289 Baſtards. *In* Berlin.

In the Towns and Villages of the *Old*, *Middle*, and *Uckermark* are Chriſtened 19058. Among which are 995 Baſtards. There were Married 4943 Pair, and Buried 13317. Among which were 23 who lived to 90, 100, and 1 to 112 Years old. So that there were 5741 more Born than Buried.

In

In the reſt of the King of *Pruſſia*'s Dominions.

	Born.	*Married.*	*Buried.*
In the Kingdom of *Pruſſia*	21384	4957	10762
In the Elect. of *Brandenburgh*	18774	4863	13015
In *Neumark*	6907	1813	4193
In the Dutchy of *Magdeburg* and County of			
Mansfield	8858	1781	5579
Cleve and *Mark*	6645	1924	6848
Pommern	8544	2241	5294
Halberſtad	2943	808	2162
Hohenſtein	604	165	389
Minden	2087	565	1925
Ravensberg	2061	613	1833
Moers	484	156	371
Geldern	1866	436	1478
Tecklenburg	475	141	437
Lingen	701	270	641
Lauenberg and *Butow*	588	149	340
French Colonies	594	177	563
	83515	21059	55830

Among the Born are 2157 Baſtards, and among the Buried 77 that were above 90 and 100 Years old. So that there were 27685 more Born than Buried.

In *Copenhagen* were Born 2604. Buried 1914, Married 701 Pair. Therefore 690 more Born than Buried.

In *Amſterdam* there Died 7119, and were Married 2289 Pair.

In *Epperies*, Born 203. Died 132.

In *Dantzig*, Born 2002. Buried 1495, and Married 537 Pair.

Continued for 1724, and 1725, by J.G. Scheuchzer, M.D. *F.R.S.* N°. 409. p. 110.

A Liſt of thoſe that were Born and Buried at Breſlaw *in* 1724.

	Perſons.
4. From the 25th to the 31ſt of Dec. 1723.	17
January 1724.	115.
February	101
March	129
April	79
May	122
June	99
July	129
Auguſt	177
September	141
October	134
November	126
1 Dec. to 24 Dec.	97
Sum Total	1466

Among the Dead were,

Married Men		231
Married Women		148
Widows and Widowers		154
Bachelors		57
Maidens		66
Children to 10 Years of Age	Boys	417
	Girls	326
Stilborn	Boys	36
	Girls	31
	Total	1466

Chriſtened.

Males	709
Females	613
Total	1322

Married 386 Pairs.

In

Buried 5524 among whom

Years of Age.	
3	of 90
2	— 92
2	— 93
5	— 95
2	— 96
1	— 97
3	— 98

Buried 5524

Years of Age. In *Vienna.*	
1	— 99
2	—100
3	—101
2	—103
1	—106
27	of 90 and upward.

Chriſtened 4427.

Buried 135. *Chriſtened* 166. *Married* 38 Pairs. At *Lubau.*

Chriſtened — Boys 107 Girls 116 Total 223

Buried
Maried Men — 29
Married Women — 19
Batchelors — 7
Maidens — 15
Children { Boys — 68 / Girls — 61
Infants — 23
Still-born — 17
Widows and Widowers — 18
Total — 257

At *Lauban.*

Chriſtened Boys — 715 Girls — 712 Baſtards { Boys—60 / Girls—70 Total 1557 At *Dreſden.*

Buried
Married Men — 161
Married Women — 151
Widowers — 35
Widows — 143
Batchelors — 72
Maidens — 71

Children { Boys — 522 / Girls — 508
Still-born { Boys — 58 / Girls — 40
Total 1761

Being 204 more than were Chriſtened. Married Couple 413.

Chriſtened in

		in		
January	79	July		78
February	71	Auguſt		94
March	99	September		79
April	78	October		79
May	74	November		50
June	69	December		63
		Total		913

At *Leipſic.*

Chriſtened in all 913. Boys 491, Girls 422; among whom there were three Children at one Birth, born *Oct.* 31. one being alive, the two others Still-born, beſides 14 Twins.

Buried		*Among which were*	
In *January*	55	Married Men	122
February	78	Married Women	81
March	87	Bachelors	51
April	109	Maidens	44
May	100	Children { Boys	234
June	74	Children { Girls	210
July	90	Women in Childbed	17
Auguſt	86	Infants { Boys	59
September	77	Infants { Girls	28
October	73	Still-born { Boys	33
November	70	Still-born { Girls	28
December	64	Widows and Widowers	54
Total	961	Total	961

Married Couple 276

At *Erfurt.*

Chriſtened 659
Buried 612
Married Couple 188

At *Salfeld.*

Chriſtened 119
Buried 90
Married Couple 24

At *Gera.*

Buried Married Men 28
Married Wom. 15
Widowers 4
Widows 22
Bachelors 6
Maidens 4
Children { Boys 76 / Girls 42
Total 197
Including 10 Still-born.

Chriſtened Boys 153 / Girls 143 — Total 296 { Including 6 Twins; one of which was Still-born.

Married Couple 82

At *Berlin.*

Chriſtened 2798
Buried 2492
Married Couple 864

		Born.	Married Couple.	Buried.
In all the King of Pruſſia's *Dominions.*	In the Kingdom of *Pruſſia*	21685	4611	13680
	Churmarck Brandenburg	19507	5019	12949
	New Marck	7044	1838	4285
		48236	11468	30914

	Born.	Marr. Coup.	Buried.
Brought over	48236	1 468	30914
Dukedom of *Magdeburg* and County of *Mansfeld*	8584	2073	6035
Dukedom of *Cleves* and County of *Marck*	6949	2071	7182
Duchy of *Pomerania*	8168	1949	5670
Principality of *Halberſtadt*	2889	781	2326
County of *Hohnſtein*	593	171	399
Principality of *Minden*	2203	684	2030
County of *Ravenſberg*	2417	680	2166
Principality of *Mirs*	426	166	529
Dukedom of *Geldren*	1861	420	1860
County of *Teklenburg*	497	146	517
County of *Lingen*	769	255	647
Lauenburg and *Butow*	607	133	361
French Colonies	711	185	546
Total	84910	21182	61182

Among the Chriſtened were 2215 Baſtards. Among the Dead 66, who lived to 90 and upwards as far as 100.

Chriſtened Boys 172
Girls 126
Total 298

Among which were 5 Twins.

Buried Married Men 34
Married Women 46 (Including 13 Widows, & 4 that died in Child-bed.)
Bachelors 13
Maidens 7
Children Boys 79, Girls 110
Total 289

At Regenſpurg, *among the Proteſtants.*

Married Couple 68

At *Amſterdam.*
Buried 7622
Married 2294

At *Venice.*
Buried 4590
Born 5046

At *Copenhagen.*
Chriſtened Boys 1306
Girls 1183
Total 2489

Buried Men 486
Women 343
Boys 991
Girls 931
Total 2751. Being 262 more than

than were born, and 837 more than there died in this City the Year before; this extraordinary Mortality being aſcribed to the Small-Pox being very rife. Married Couple 748.

At *Dantzic.*

Chriſtened 1999 Married Couple 488 Buried 1872, or 377 more than the Year before.

Bills of Mortality for the Year 1725.

At *Breſlau.*

From *Dec.* 25 to 31, 1724	30	
January 1725	125	
February	115	
March	129	
April	166	
May	122	
June	106	
July	121	
Auguſt	107	
September	115	
October	141	
November	97	
Dec. 1, to 24	67	
Total	1441	

Among which were		
Married Men		259
Married Women		153
Widows and Widowers		158
Bachelors		64
Maidens		58
Children to 10 Y. old	B.	364
	G.	306
Still-born	B.	44
	G.	35
		1441

Chriſtened.

Boys	664
Girls	675
Total	1339

Married.

363 Couple.

At *Vienna.*

Buried	Men	1007
	Women	1433
	Boys	1865
	Girls	1560
	Total	5865.

Chriſtened 4708

Among which

8	of 90
1	— 91
3	— 92
2	— 93
1	— 94
3	— 95
2	— 96
2	— 98
1	— 99
3	— 100
1	— 102
1	— 103
1	— 106

29 of 90 and upwards.

Chriſtened

Chriſtened Boys 758
Girls 714
Baſtard { Boys 68 / Girls 60
Total 1600

Buried Married Men 225 At *Dreſden.*
Married Women 174
Widowers 36
Widows 65
Bachelors 99
Maidens 167
Children { Boys 478 / Girls 398
Total 1642
Among which, Still-born { Boys 53 / Girls 33
Married Couple 519

Chriſtened Boys 478
1 *Jew*, 20 years of Age.
Girls 461
Total 940.
Among which were Poſthumous Births 6
Twins 12
Baſtards 141
And among them 3 Twins.

Married 260 Couple.

Buried Married Men 113 At *Leipſick.*
Married Women 75
Bachelors 49
Maidens 34
Boys 165
Girls 106
Women in Childbed 10
Children { Boys 58 / Girls 51
Still-born { Boys 45 / Girls 24
Widows & Widowers 77
Total 807

Buried 617 *Chriſtened* 624

Married 183 Couple. At *Erfurt.*

Chriſtened Boys 105
Girls 101
Total 206

Among which 3 Twins and 8 Baſtards.

Buried Married Men 35 At *Coburg.*
Married Women 35
Women in Childbed 2
Batchelor 4
Maidens 10
Children 96
Total 182
Six of the Children were Still-born.

Chriſtenings

According to the Months.

	Christenings.	Burials.		Christenings.	Burials.
January	17	22	*July*	12	18
February	27	13	*August*	10	14
March	24	18	*September*	21	13
April	18	20	*October*	23	15
May	16	11	*November*	11	9
June	15	10	*December*	12	19
	117	94		89	88
				117	95
Married Couple		46	Total	206	183

At *Regenſpurg* among the Proteſtants.

Chriſtened	Boys	142
	Girls	126
	Total	268
Among which 4 Twins.		

Buried

Married Men		42
Married Women		39
Bachelors		13
Maidens		11
Children	Boys	58
	Girls	50
	Total	213
Married Couple		80

At *Franckfort* on the *Main*.

Chriſtened	Boys	346
	Girls	385
		731.

Including 10 Twins, 4 Poſthumous Births 1 *Jew*, 2 Foundlings, and 22 Baſtards. Buried 843.

Chriſtened at *Sachſenhauſen*,

Boys	87
Girls	79
	166.

Including 2 Twins and 9 Baſtards.

Buried at *Sachſenhauſen* 168

Married Pairs at *Franckfort* and *Sachſenhauſen* 209

Marriages at *Amſterdam* in the Reformed Church.

In 1724	2294
1725	2249

At *Venice*

Born	4836
Buried	4816

At *Dantzic*.

Chriſtened	2012
Buried	1678
Married Couple	46

VI. 1. *Ephemerides* hae *Meteorologicae* notantur pro ſingulo anno in Tabula chartacea maxima, quae duodecim Areolas continet, pro unoquoque menſe unam, quarum Illam Menſis Januarii Anni 1731. Speciminis gratiâ in Fig. 8. apponitur: Quoniam autem omnia ſigna in caeteris Tabulae partibus uſurpata in hoc menſe non occurrunt, in Fig. 14. alia ſpecimina nonnullorum Dierum diverſorum Annorum, quae cuncta complectuntur ſigna, adjunguntur. In calce Fig. 8. ſigna, quibus uſus fui, in Meteoris annotandis, explicata habentur, unde cuncta in hujuſcemodi TABULIS METEOROLOGICIS conſtruendis neceſſaria facilè & primo intuitu intelligentur. Cum plena eorum, quae in hiſce Ephemeridibus annotantur, hîc loci futura ſit nimis prolixa Enarratio, res ſolummodo magis notabiles recenſebo.

Siniſtro Tabulae lateri menſis nomen ponitur, huic dextrum verſus adjacent numeri altitudinem Barometri in pollicibus Rhenolandicis, eorumque lineis indicantes, hi parte infima incipiunt à 28, deſinuntque in 30, quia raro in hiſce provinciis Mercurius ad minorem altitudinem quam 28 pollicum in tubo deprimitur, rariſſime ad 30 uſque pollices adſcendit: commode idcirco omnis altitudinis varietas, cui Mercurius in Barometro ſubjicitur, intra aſſignatos hos numeros ſcribi potuit; idque ſolius puncti ope, poſiti accurate in loco, qui Mercurii altitudinem exprimebat: Captae ſunt Barometricae obſervationes ter quocunque die, manè horâ ſeptimâ; in ipſa meridie; & veſperi horâ undecimâ, quibus temporibus quoque Thermometri altitudines fuerunt notatae. Thermometro uſus fui, Mercurii pleno, quod Fahrenheytius ſecundum ſuam tabulam fecerat, cujus conſtruendi modum tradidi in commentariis, quos Florentinis tentaminibus experimentalibus adjunxi: ſcala ita ſe habet, ut Mercurius in tubo deſcendat ad graduum initium, ſive 0, cum Thermoſcopium hyeme Nivi cum Sale Ammoniaco permiſtae imponitur; inde ſurſum verſus gradus 32 eſt, cum aqua gelare incipit; gradus eſt 214, ad quem aſſurgit Mercurius, cum ebullienti aquae tubus immiſſus fuerit: quae pauca notata ſufficiunt: ſuſpenſum in aperto aëre, ſed umbroſo manet ſemper hoc Thermoſcopium, ita ut vere Atmoſpherici aëris calorem friguſve indicet. Vides in Tabula Meteorologica numerum 29 pro Barometro, ab eo per medium menſis dextrum verſus ſcripti ſunt dies menſis ab 1 & 31, lineis nigrioribus diſtincti cum ſuis numeris, quilibet dies binis tenuioribus intermediis lineis, in tria diſtinguntur ſpatia, tribus quotidianis obſervationibus deſtinata, quae memoratis horis captae ſunt: obſervationes Thermometricae ſcribuntur in ſerie ſuprema menſis, à ſiniſtris dextrorſum: Ventos, eorum plagas & vires excipit ſeries ſecunda. Pluviae copiam capit tertia ſeries; hanc colligo ſimili methodo ac in obſervatorio Pariſienſi. In quarta ſerie numeri denotant copiam aquae, quae ex vaſe aperto, ſed umbroſo in loco poſito, in auras exhalat. Eſt hoc vas plumbeum accurate parallelepipedum, cujus quodlibet ſupremum latus 6 pollicum, altitudo 18 pollicum; hoc impletur ſingulo menſe ad altitudinem

A Regiſter of Meteorological, Barometrical, Thermometrical, Epidemical, and Magnetical Obſervations at Utrecht, *in* 1729; *by* Peter Van Muſchenbroek, *L.A.M. Med. & Phil. D. Phil. & Matheſ. Prof. in Acad.* Ultraj. N° 425. *p.* 357.

Fig. 8.

Fig. 14.

dinem 16 pollicum, & curatur, ut ſemper aqua duobus pollicibus ſit margine ſupremo depreſſior. In alia ſerie notavi Lunae phaſes, ut viderem quaſnam mutationes hic planeta noſtrae Atmoſpherae induceret. Denique in ſerie undecima habetur Inclinatio Acûs magneticae, qualis ipſa meridie fuit: eſt haec acus quatuor longa pedes, quâ, opinor, nullam exſtare aeque perfectam, ejus deſcriptionem tradidi in Diſſertationibus Magneticis, pag. 190. Tandem in ſerie infima conſpicitur Declinatio Acus Magneticae, 6 pollices longae, incluſaeque Machinae, quam in Diſſertationibus Magneticis, pag. 233, delineavi: haec inſiſtit grandi lapidi plano, medio in horto, ita ut recta, quae per notam ſeptentrionis & meridiei tranſit, verae lineae meridianae inſiſtat; ita facillime & abſque ullo labore, quocunque tempore Magneticae acûs declinationem obſervare licet; tempus ipſum meridianum ſemper elegi, ut melius Inclinationem cum Declinatione comparare poſſem. Haec Tabulis Meteorologicis intelligendis ſufficiunt; addam nunc alia, quae Tabulis inſeri nequeunt, quaeque praeter notata animadverti.

Regnavit menſe *Januario* intenſum frigus, praecipue die 6, 11 & 19, dubitoque utrum in his regionibus quis unquam acrius gelu obſervaverit, cum Thermoſcopium ad gradum uſque quartum ſubſederit: interim a 1 ad 15 *Januarii* erat humilior Mercurius in Barometro, quam, cum gelat, apud nos eſſe ſolet: preterea gelavit vento ex qualibet mundi plaga ſpirante, quod non admodum frequenter contingit: plerumque die uno vel altero praecedente Lunae phaſin, ſive ea plena ſive nova, ſive in quadraturis fuerit, mutabatur tempeſtas remittente aliquantum gelu: tantum hoc ſidus in aërem noſtrum efficaciam habet, quo tempore enim maxime gravitare incipit in terram, atque haec in ipſam, condenſari videntur quoque nubes, coeunteſque vaporoſae particulae graviores fieri; quam ut ab aëre in equilibrio ſuſtineantur, decidunt ita ſub forma pluviae, nivis, grandiniſve, & ventos ſuſcitant, qui ſuo attritu calorem gignunt, utque regelet, faciunt. Memoranda eſt nivis forma, quae ante meridiem diei ſexti cecidit; erat nix omnis roſacea ſtellata, aut ex partibus ſemiformatarum Stellarum, ruptarumve conſtabat: Microſcopio eam ſollicite inſpexi, videbatur eſſe nix quatuor ſpecierum, omnis tamen hexangula, fere ſimilis illi, quam Carteſius anno 1637, Amſtelodami obſervavit, ſed quam multo elegantius depinxit Hookius in Micrographiae Schemate viii, pag. 88, aut Caſſinus in Pariſinae academiae monumentis, anni 1692, figuras Nivis à me obſervatas accurate delineavi in Fig. 9. roſaceam refert, quae maximam faciebat partem erat diverſae magnitudinis, quippe nonnullarum diameter partem erat $\frac{1}{100}$ pollic. Rhenol. aliarum $\frac{10}{100}$ aliarum $\frac{11}{100}$. Hujus quoque magnitudinis fuerunt flocculi figurae 2 & 3. Ramoſi autem erant alii Fig. 12. Quorum magnitudo $\frac{20}{100}$ vel $\frac{21}{100}$ pollic. Rhenol. Sed quam rara erat haec nix! non memini me ullam ſimilem vidiſſe, implevi eâ vas parallelopipedum, 12 altum pollices, quod in calido

Fig. 9.

Fig. 12.

poſitum loco ſolutam nivem praebuit ad dimidii pollicis altitudinem, adeo ut nix haec vigeſies quater aqua rarior fuerit: haec raritas profecto inſolita, nam Sedilavius, de la Hirius aliique nivem raram aquâ eſſe ſextuplo leviorem, hic autem nivem rariſſimam duodecuplo leviorem obſervavit, at duplo adhuc rarior nix à nobis notata fuit. Quomodo hexangula ejuſmodi progignatur nix, non exponam, variae videantur opiniones apud Carteſium in princip. Philoſ. Keplerum de Nive ſex angula. Eraſm. Bartholinum de figura Nivis. Millietum in Tract. de Meteoris, tum Acta Philoſ. Britan. N° 92 & 376. Delapſa haec nix ſecum terribile frigus & gelu advehebat, praecipue poſt horam 5 veſpertinam, quod perduravit ultra horam 12 nocturnam; toto hoc tempore Vinum, quod ex profunda deferebatur cella in angulum conclavis, ubi largus exſtructus erat focus, momento citius conglaciabatur, imo vix, in tabula, non procul à foco poſita, à congelatione deſiſtebat infuſum Scyphis: pari modo, quicquid in glaciem abire poterat, infeliciſſime rigebat. Simile frigus omnia exuſſit 11 hujus menſis die; verum providiſſimus rerum humanarum arbiter voluit, ut brevis modo eſſet hoc acerrimum gelu durationis, conſulendo & proſpiciendo multorum animantium vitae, & vegetabilium conſervationi. Alterius forme, quam ſupra memini, nix rarariſſima cecidit 8 Januarii horâ 3 poſt meridiem, conſtabat ex meris tantum oblongis ſpeculis, quae vix $\frac{1}{10}$ pollicis parte aequabant, tenuiſſimae caeteroquin, & proinde ſimpliciſſimi Nivis flocculi.

Duravit gelu uſque ad 22 diem, unde adeo craſſa evaſit glacies, ut in nonnullis amplioribus foſſis, aquam ſtagnantem comprehendentibus, eam altitudinem 20 pollicum Rhenolandicorum acquiſiviſſe dimenſus ſim: in fluvio rapide decurrente, minima glaciei craſſities fuit 12 aut 13 pollicum: ut cunque craſſa fuerit, reſoluta erat penitus 1 Februarii, ita ut plurimis in foſſis ſuburbanis vix glaciei indicium daretur; quae ſubitanea contigit regelatio propter maximam pluviae copiam, que poſt 22 diem cecidit.

In principio Januarii erant hinc & inde Morbilli, ſed mitioris indolis, quibus correpti infantes leviſſime aegrotabant, nulli, aut ſaltem pauciſſimi interierunt: quamdiu interim regnavit gelu, uſque ad illud tempus, quo remittere caepit, nullis civitas laborabat fere aegritudinibus, frigore quaſi aeque ex aëre ignem, ac morborum quorumcunque ſemina propellente: at ſimul ac regelabat, hoc eſt 24 Januarii, jam Anginae & Ardentes febres Tragoediam inchoabant, cum corpora ab acri gelu antea conſtricta, nunc à pluvioſo, tepente humidoque aëre, furibundis agitato ventis, ſubitiſſime relaxabantur, quippe increverat calor ipſâ meridie diei frigidiſſimae à gradu 8 add 44 die calidiſſima ſecundum Thermometri ſcalam, quem caloris mutationem intra tam anguſtam temporis ſpatium humana corpora incolumi ſanitate ferre non poſſunt. Sed praecipue ad maximam ponderis Atmoſpherici mutationem attendendum eſt, ſubſedit enim in Barometro Mercurius nocte inter 24 & 25 diem intermedia adeo celeriter, ut

vix meminerim rapidioris Mercurii delapsus ; stetitque in humillima fere statione parum supra 28 pollices ; quoniam igitur humani corporis sanguifera vasa, antea à magno Atmospherae pondere compressa, & ab intensissimo frigore magis adhuc constricta ; nunc citissime relaxabantur, tam à calore, quam ab Atmosphaerae leviſſimo pondere, non potuit non sanguis errore loci in vasa tam subito aperta irruere, atque inflammationem, hanc vero febrim cum aliis symptomatibus suscitare.

Lubet autem Anginarum tum regnantium brevem adnectere historiam, quia hae non semper ejusdem naturae sunt, eam igitur ex propriis observationibus depromam. Saniſſimos, eosque qui cubitum euntes nullam alicujus aegritudinis indicium perceperant, mediâ nocte corripuit Angina, inflammans subito amygdalam dextram, uti in plerisque contigit : mox acceſſit febris, cum capitis dolore, rigore cervicis & dorsi, quod etiam non aliter frigere credebatur quam si frigidâ perfusum fuisset. Sequenti die cum eodem dorsi rigore febris perstitit, homotonos : nonnulli quos levior corriperat febris, alterâ nocte in largiſſimos sponte illapsi sudores, mane surgebant sani, prorsus à morbo liberati, sed plus debilitati, quam à tam brevis durationis febre contingere solet : quod latentis alicujus malignitatis suspicionem incuſſit. Non adeo beati alii fuerunt, acriori febre laborantes, his enim Angina increvit usque ad tertium diem, etiamsi liberalis Venae sectio & larga purgatio alvi à principio morbi instituta fuerit ; quae bina tamen bis terve repetita levamen tertio die attulerunt : interim Urinae erant flammeae, faetentes insignitur : sudores nulli, nullusque somnus, capitis ingens dolor, artuumque omnium Lassitudo, ac si fustigati fuissent : lingua vix obducta : evanuit morbus in nonnullis quinto die, cujus crisis largus sudor fuit, manente Urinâ per totum morbi decursum rubicunda, limpida. Corripuit haec Angina absque discrimine Infantes & Adultos. In multis, ab Angina jam curatis, post biduum recruduit febris continua, à quâ aegroti non nisi 6, 7ve diebus elapsis curabantur. Jam ab aliquot retro observavi annis, hyeme post praeteritum gelu Anginas increbescere simul ac regelare incipit ; praecipue si subito regelet.

Saeviebant praeterea aliae Febres continuae, ardentes, quotidie circa vesperam, novo comitante frigore, exacerbatae : Aegrotantibus lingua erat arida, fusca, sitis magna, insomnolentia, deliria ; capitis dolores cruciantes, per totum morbi decursum continuati ; oculi fixi, & quasi immobiles, cum scintillis obvolitantibus : nonnullis abdomen inferiori parte rigebat, atque hi non nisi cum difficultate urinam dimittebant ; aliorum cervicem prorsus rigidam reddidit febris : aliis totum corpus statuae instar rigebat, hi nec videre nec audire, nec se movere per biduum ante mortem poterant. Alii crebris convulsionibus agitabantur aliquot ante obitum diebus : plurimi moriebantur 14 die, ab invasione morbi prima supputando,

nullum

nullum evasisse observavi, cui in morbi principio sanguis liberaliter eductus non fuit; etiamsi remediis diluentibus humectantibus, refrigerantibus fuerit usus: sed plerumque incolumes evaserunt, quibus larga & repetita secta fuit Vena: sanguis eductus non multum à sano statu recessisse videbatur, gerens vix ulla Inflammationis vestigia. Debiliores nonnunquam aphthis corripiebantur, densis, flavis, certo lethiferis: observavi hanc febrim aeque in Infantibus ac in Adultis.

Quoniam in doctrina Magnetica aetatem terere in animum induxi, quotidie Inclinationem & Declinationem acuum ipsâ meridie observavi: Miratus sum non mutari Declinationem, quo tempore inclinatio mutatur: quod non tantum hoc mense Januario ita se habuit, sed tribus annis, quibus observandae huic rei incubui, idem obtinere animadverti. Novis Magneticis viribus impregnaveram primo Januarii utramque acum, ut quamdiu vis illibata in ferro maneret notare quoque possem: in acu Inclinatoria satis generosa 2 ½ annorum spatio perstitit, non diutius: quam diu in vulgari Versorio constabit, propter infortunium infra memorandum determinare nequeo, aeque diuturnam tamen ac vim priorem fore, nullus dubito, novi enim vulgares Compassus in navibus ex Orientali India nostros in portus redeuntibus, adhuc dum vigere, qui solventes abhinc Magnetica virtute impregnati fuerant. Attende ad ventos, hos in Magnetem imperium non habere observabis, quippe Inclinatio & Declinatio variat duobus se sequentibus diebus, quibus tamen idem ventus spiravit: altera occasione ex alia plaga spirante Vento diebus binis sibi proximis, immobilem perstitisse Inclinationem una cum Declinatione notabis. Multo minus aut coeli serenitas, pluvia, nix, tempestas, aliquid in vim Magneticam operantur: Nam saepe observavi unius mensis spatio oscillatorio actam fuisse motu aeque acum Inclinatoriam ac Declinatoriam: nunc enim Inclinatio major, nunc iterum minor est, & versus Occasum quae nunc datur Declinatio, hodie increscit, cras decrescit, major iterum sequenti die. Discrimen inter Inclinationem minimam, quae fuit 67 gradum, & maximam quae fuit 68° 28′, est 1° 28′. Declinatio versus occasum minima 12° 40′, & maxima 13° 20′, dat discrimen 40 Minutorum.

Feb. 8 dabatur Halo circa Lunam, ab hora 7 ad 9 ½ vespertinam, ejus diameter erat 3 ½ vicibus major, quam Lunae apparens diameter erat; tenet fama esse praesagium imminentis tempestatis, quod fabulosum videtur, sequenti enim die coelum tranquillum fuit.

Vigesimo quinto hujus mensis plurimi Coryza correpti sunt homines, cum a 20 ad 24 magnus, ratione temporis habita, in Atmosphaera obtinuerat calor, qui totum humanum corpus laxaverat; supervenit nox 24 diei frigida, flante Boreâ, hinc illico constringebantur vasa à frigore, suscitataque fuit inflammatio in Membranis aëri maxime expositis: vix ullas pertinaciores hisce animadverti Coryzas, inflammatione membranae Schneiderianae proserpente per totam Asperam arteriam usque in Pulmones; hinc tussis, quae interdiu quidem mitis

& rara, sed exacerbabatur ab horâ nocturnà 11 usque ad 3, à quo tempore mitescens, aegrotis requiem concedebat: molestissima haec tussis 3, 4, imo plurium septimanarum spatio duravit, quibusvis resistens auxiliis, Venae sectioni, purgantibus, sudoriferis, emollientibus, humectantibus, narcoticis, expectorantibus: optime aliquando auscultabat revulsioni factae ope Tabaci Brasiliënsis, è quo turundae naribus immissae maximam irritationem, & versus nares materiae acris derivationem praestiterunt: quae huic quoque restitit remedio, tussis, tantum temporis longinquitate curata fuit. Maxima inclinatio magneticae acus fuit 69° 30′, minima 68° 25′. Maxima declinatio fuit 13° 20′, minima vero 13° 10′.

Martii 27, hora vespertina 10 ½ prima hujus anni à me conspicebatur *Aurora Borealis*, aliquantum insolitis stipata apparitionibus: à plaga coeli Boreâ occasum versus, usque ad plagam N. W. t. N. tum à Boreâ quoque ortum versus, usque ad plagam N. N. O. ab horizonte usque ad altitudinem 20 graduum, obductum erat coelum nube tenuissimâ, & quidem adeo rarâ, ut Stellae secundae & tertiae magnitudinis per eam translucerent, lucebat tamen notabiliter: superior ejus limbus inaequali margine descriptus erat: ex loco ejus quodam intermedio columna exsurgebat, in horizontem perpendicularis, 10 gradibus supra supremum eminens limbum, transiens per mediam Cassiopeam, ejus lux erat aequabilis, placida, nequaquam mota, & diutissime perstabat: imo nec ex nube ulli radii columnaeve igneae, quales emitti in auroris hujusmodi solent, excutiebantur: fuit igitur haec aurora ultra solitum placida, coelum erat coeteroquin admodum serenum, spirante Euro satis valido, impetusque secundi: verum supra Venti hujus regionem materia hujus Aurorae in absoluta suspendebatur tranquillitate: adeoque ad insignem altitudinem ejusmodi materia sive propter levitatem, raritatemve, in atmosphera adscendere videtur, uti quoque ex aliis observationibus probari facile posset.

Sequente die reliquiae hujus aurorae adhuc aderant, componebant tantum nubeculam tenuem, vix lucidam, non ultra 20 gradus supra horizontem elevatam, neque emittentem ullos lucentes radios columnasve, nec à Borea longe Ortum aut Occasum versus porrectam; fulgebat adhuc mediâ nocte, postea evanuit nullo sui relicto signo.

Interim hoc mense siccior vix ullus unquam fuit, cum pluviae copia modo lineam 1 ¼ adaequaverit: in principio satis strenue gelavit, ita ut 10 Martii omnium fossarum glacies adeo densa evaserit, ut quaquaversum iter calepodiis ferratis incedendi concesserit civibus, neque ulla navibus via libera fuerit, verum 12 *Martii* gelu aliquantum remittente, Sol per purum aërem tam fortiter interdiu radios suos in glaciem vibrabat, ut magna ejus pars 13 die liquefacta fuerit, & navis hac vespera ex nostrae urbis portu soluta Amstelodamum petierit; quae ambo, gelu nempe tam intensum hoc mense, & tam celeris regelatio, in his regionibus rariora sunt. Tam subita aëris mutatio

tio non poterat non morborum esse causa, imo hinc illico dabatur Pleuritis & Peripneumonia, quae utraque mitis & benigni moris fuit : quippe in Pleuriticis febris quidem primo die fuit : continua, sed exigua, cum leviusculo lateris punctorio dolore, occupante Thoracis superiorem anterioremque partem : sequenti die usque ad inferiores costas dolor descendit, interim sputa excreabantur flava, striis interspersis sanguineis, tussis nec molesta, nec frequens : alvus satis naturalis, somnus bonus atque reficiens, linguae color vix mutatus, parva sitis, Urina parum intensior solito, limpida : quae optima profecto mitissimae indolis erant indicia ; 3 etiam die febris una cum omnibus symptomatis penitus cessabat : curabatur haec pleuritis resolutione benignâ naturae, absque Venae sectione, sed copiosa ptisanae potatione, usu mellis, leviorumque Ciborum ; potissimum afflixit hic morbus senes & adultos.

Eodem tempore in Scenam prodibat Peripneumonia, incipiens cum capitis magno dolore, febre exigua, pectoris angustiâ modica, respiratione solito breviori : ilico tamen magna aegros infirmavit debilitas, quo plus mali latere suspicatus fuissem, nisi Pleuritides, tum grassantes, adeo benigne fuissent : sanguis Venae sectione eductus, nequaquam inflammati speciem praebebat, sed naturalis instar erat : Urinae intensioris rubedinis, sudor moderatus ; somnus quoque modicus, quietus, semper reficiens : jam abhinc 2 aut 3 die in urina nubecula dabatur, satis gravis : sputa excreabantur levia tenuia, tussis admodum molesta, capitis dolorem exacerbans, sitis modica, linguae dorsum ruffescens, alvus constipata ; postero die mitigatior febris, Urina materiae criticae plena ; qualis sequentibus diebus mansit, ado ut morbus omnino intra 7, 8ve dies terminatus fuerit : tussis autem aliquanto pertinacior diebus 2, 3ve ulterius durabat, fugata tamen feliciter usu mellis : vix postulabat hic morbus medici auxilium, evanuitque, sive secta vel non secta fuerit Vena ; sive remedia, sive nulla fere propinata fuerint. Verum sub finem Martii multo atrocior Peripneumonia grassari coepit, cum spirante Euro noctu gelebat, interdiu autem coelo admodum sereno Atmosphaera meridianis horis non parum calebat, usque ad gradum 54, 58, 59 Thermoscopii : ejusmodi caloris frigorisque subitaneis vicissitudinibus ferendis humana corpora vix paria sunt, quin in acutissimos incidant morbos : ideo perquam acuta febris, quotidie circa vesperam exacerbata, cum frequentissima tussi, aegros extemplo corripuit, sanguinemque admodum inflammatum reddidit, uti Venae sectione apparebat : singularia symptomata per totum morbi decursum non adfuerunt, perierunt solito plures aegroti, qui evaserunt, 14 dierum curriculo decubuerunt.

Inclinatio acus Magneticae maxima hoc mense fuit 70 graduum, minima 68° 10′. Declinatio maxima 13° 40′, minima 13° 15′. Suppeditavit *Aprilis* 28 ante meridiem pulcherrimum Phaenomenon, quod

quod hora 10 ½ detexi, verum quod usque ad horam 11 ¼ spectatum fuit.

Fig. 13. *Fig.* 13. Ut clare hoc intelligas, concipe spectatorem P faciem versus Austrum, dorsum, versus Boream direxisse, atque ita oculos ad coelum sustulisse, apparebant tum duo circuli in coelo cum interrupta parte alterius, quorum omnium planum erat ad horizontem parallelum : erat spectatoris Zenith Z, centrum circuli maximi F K H G, sive potius annuli, cujus diameter interna fuit 58° 15′, latitudinem autem non bene metiri poteram, judicabam esse majorem 30 minutis : nullos quoque in ipso detexi colores, & tantum apparebat albus. Secundi circuli A B D centrum occupabat Sol S, secans priorem in duobus locis K, H. Eumque aliquousque ingressus : ab altera sectione H, in circulo priori albo erat locus aliquis G, splendidior reliquo magnitudinis ejusdem apparentis cum sole, à parte Solem spectante coloribus erat variegatus, distantia H G fuit 50° 30′, diameter interna circuli A B erat 45° 30′, coloribus tingebatur hic circulus variis, à parte interna Solem versus rubebat, extima parte albebat, intermedii colores erant coerulei pallidi ; clarissime conspiciebantur in tractu D aliquousque protenso : mirabar hunc circulum non fuisse ubivis aeque latum, sed angustissimum esse in K D H. Latitudo hujus annuli fere duplo minor priori mihi visa fuit, non tamen pro voto satis accurate dimensus fui. Tangebatur hic circulus ab arcu aliquo circuli tertii E, maxime meridionalis, qui quoque albus, omnibusque coloribus destitutus videbatur : Hic arcus primus omnium à conspectu evanuit : tum pars orientalis A circuli colorati aufugiebat, quam pars meridionalis E sequebatur : tum peribat quoque portio F orientalis circuli albi : cujus interitum sequebatur occidentalis pars B circuli colorati ; mox evanescebat occidentalis portio G circuli albi, ejusque tandem pars maxime septentrionalis.

Coelum toto hoc tempore erat exiguis nubibus, hinc inde quasi interruptis obductum, non quidem densis, sed quoque non admodum raris, quae tamen altissima in atmosphaerae regione suspensae videbantur : durante phaenomeno ventus flabat Euro boreus, inter primum & secundum impetum : qui increvit ad secundum gradum evanescente phaenomeno, atque ita horae spatio perstitit, lenior iterum postea. Contigit hoc tempore Novilunii, atmosphaerae calore temperato : sollicitus attendi, an quaedam corpuscula è coelo deciderent, sive glacialia sive aquae, quibus ceu causae adscribi apparitio circulorum potuisset, quemadmodum in Pareliis contigisse Hugenius, Maraldus aliique eruditi annotarunt, verum nihil collegi aut observavi : relatum eodem die a viris fide dignis mihi fuit, binis praecedentibus diebus sese ante meridiem circa Solem annulum animadvertisse ; quem cum non viderim, nihil de illo affero.

Observavi hoc mense morbillos, etiamsi non frequentes, mitioris quoque genii, ita ut nullum infantem, meae curae commissum, trucidarint.

darint. Circa medium hujus menſis, calore jam relaxante corpora diuturno hyemali frigore conſtricta, inceperunt Tertianae intermittentes, quae omnes, uti Vernales plerumque eſſe ſolent, erant benigni moris, increſcebant tribus primis paroxyſmis, tum decreverunt, ceſſantes ut plurimum intra ſex paroxyſmos vel ſuâ ſponte, vel uſu amarorum calefacientum, aut aliquorum Salium lixivioſorum.

Tertianae duplices quidem paulum pertinaciores, ſed adeo faciles curatu tamen, ut non parùm honoris medicinae tribuerint.

Hinc inde peripneumoniâ ſenes tentabantur, admodum lethali, nulli remedio auſcultante morbo.

Inclinatio magneticae acus maxima fuit hoc menſe 71 graduum, minima 68° 45′. Declinatio acus maxima 13° 35′, minima 13° 10′.

Maii principium non niſi ingratos acris hyemis & triſtes diuturni frigoris effectus ſpectandos praebebat, nulla enim arbos gemmas protruſerat, niſi quod hinc inde mala Armeniaca & Perſica, Soli maxime expoſita in tepentibus locis vento non expoſitis floris conglobata petala oſtendere incipiebant: ſero admodum: Tiliae, ambulacra urbis ornantes, triſtes adhuc & abſque foliorum indiciis, nec laetiora erant adhuc prata: verum poſt diem 20 calor effuſis quaſi a Sole Venis omne Vegetabile perfudit, ita ut impetu facto prorumperent folia floreſque ex arboribus, molliumque herbarum cacumina increſcere ad ſpectatoris oculos feſtinarent: quod annum admodum fertilem reddidit, abundarunt mala Armeniaca & Perſica, ſuo poſtea tempore probe matura. Liberaliſſimam Ceres ſuorum fructuum colonis largita eſt meſſem, cum aeſtas & autumnus coelo fruebantur ſereno, calido, modicâ irriguo pluviâ. In his regionibus jamdiu obſervatum eſt; hyemem diuturnam, non nimis acrem, vernalem calorem ſero venientem, annum fertilem portendere, nam plerumque in principio Maii noctes frigidae, imo gelantes, dantur; corrumpentes tenellos florum fructuumque embryones; quamobrem ſi hi ſero prorumpant, certam ſpem fructuum relinquunt.

Quarto *Maii* hora 10 verſpertina ambiebatur Luna coronâ, in quâ nihil inſolens, eam quoque nec ſecuta eſt tempeſtas, nec impetuoſior ventus.

Poſt 25, Fluvius Lecca, ſeſquimilliaris diſtantia ab hac urbe fluens, tanta aquae copia impletus erat, ut prope Batavodurum aggeres ſuperaverit; infra hanc urbem oceanum verſus, 5 pollices altius ſtetit aqua, quam erat nota periculi imminentis, quae nonnullis aggerum locis impoſita eſt; manabat aqua ex Rheni ſcaturigine, excipientis nives vernali calore celeriter ſolutas: Nivis autem prodigioſa quantitas cecidit circa Genevam a 16 Maii ad 20, quae omnes operuit vias, quod ea anni tempeſtate in illis terrae locis oppido rarum: haec nix ſoluta Rhenum adeo turgefecerat, hic Leccam.

Una cum menſe incoabant Pleuritides mites, in quibus vulgaria modo ſymptomata, ſugabanturque ſatis cito, Venae ſectione, refrigerantibus diluentibus humectantibus. Verum inter Infantes regnavit Febris Scarlatina, inficiens omnes, quotquot eaſdem aedes inhabitabant, eaſ-

demve

demve ſcholas frequentabant: primo die correpti febre Infantes, de dolore circa praecordia querebantur, qui poſteris duobus diebus eos adhuc affligebat, cum ſiti magna, hinc arida lingua albo obducta muco; febris interim continua, homotonos: ſub finem 3 diei & in principio 4 totius corporis cutim occupaverunt exiguae poſtulae, planae, adeo ſibi contiguae, ut vix ſpatium intermedium relinquerent; hinc coccineo colore totum corpus rubebat: in facie tamen pauciores puſtulae, palpebrae autem exiguis punctulis rubris, tenuiſſimam acûs cuſpidem non ſuperantibus, perfoſſae videbantur; ſequentibus temporibus lingua ruberrima evaſit: ſomnus prioribus 4 diebus nullus, aut ſaltem continuo interruptus, cum convulſionibus & delirio; 5 die acceſſit ſomnolentia, rubedo minus intendebatur, accedente inani alvum deponendi perpetuo conatu: decrevit febrilis impetus: labia autem oris torrida, fractaque inciſuris, quibus poſteris diebus febris magis decrevit, incolumes evaſerunt 10 die, ſequente totius cutis deſquammatione: verum in aliis aucta febris 5 die ſuſcitavit deliria, convulſiones, quibus 8 die moriebantur: Lethalis fuit hic morbus nonnullis.

Inclinatio acus maxima fuit, 70° 35′. Minima 69° 25′. Declinatio maxima 13° 8′. Minima 12°.

Junio fuerunt dies calidiſſimi, quibus ſimiles reliquo anni decurſu non fuerunt, uti 19, 21, & 22, hiſce enim diebus Thermometrum meridie oſtendit gradus 86, 90, 92. Noctes tamen aliquae hujus menſis fuerunt frigidiſſimae, quibus gelavit, ut 9, 10, 11, 12 contigit diebus. Quam funeſtis luctatus fuit hic annus cum Variolis! Menſe hoc inceperunt, diſcretae, mitiſſimi generis, ut poſtea tanto lugubriorem Tragoediam luderent, quae nunc dabantur, accuſari non poſſunt, nihilque inſoliti praeſtabant. Poſt medium hujus menſis Synochi putres dabantur, oriundae proculdubio a magnis viciſſitudinibus caloris frigoriſque, cum enim prioribus noctibus gelaverat, interdiu à maximo calore corpora admodum relaxabantur, hinc febres acutae, dominantes tamen potius in vulgus, negligentiorem ſui corporis curam gerens, quam in temperatos cives.

Inclinatio acus maxima fuit 71° 15′. Minima 70° 25. Declinatio maxima 13° 45′. Minima 12° 17′.

Julio pauci obſervabantur morbi, Variolae tamen manſerunt, virium incrementum capientes, atque ideo hinc inde lethales: vidi florentis aetatis virginem cum confluentibus luctantum variolis, tanto ſanguinis impetu laboraſſe, ut menſtrua copioſa 4 die prodierint, extraordinario tempore, quibuſcum die 6 periit. Erat hic menſis ficciſſimus, totus aër arebat, exſiccans plantas & animalia, hinc faucibus exſiccatis oriebantur hinc inde anginae inflammatoriae, quae magis increbuiſſent, niſi 27 & 28 die benignum Numen pluviam è coelo dimiſiſſet, aquâ refecta fuerunt Vegetabilia & cuncta animantia.

Inclinatio acus maxima fuit 72° gradium, minima 71° 30′. Declinatio maxima 12° 55′, & minima 12° 28′.

Auguſto

Augusto frequentia mugiebant tonitrua, delapsaque copiosa fuit pluvia. Mitescere parum, dolosae adeo, videbantur Variolae, plurimos quidem invaserunt, sed discretae erant fere omnes, vix iis correpti aegrotabant, nullaque exigebant Variolae remedia, sicque feliciſſime curabantur.

In Scenam quoque prodibant Febres Tertianae intermittentes, veluti Autumno fieri solet, sed aeque benignae ac Vernales fuerunt, feliciter profligabantur aut amaris antifebrilibus, aut salibus Lixiviosis, vel Ammoniaco, raro ultra sextum paroxysmum durantes.

Inclinatio acus maxima fuit 72° 3′. Minima 71° 0′. Declinatio maxima 13° 36′. Minima 12° 25′.

Septembris 26, inter horam 5 & 6 vespertinam magna corona circa Solem conspecta fuit; eam tamen ipse non vidi; quoniam narrationibus indoctorum non multum fidi potest, malui ab hujus coronae descriptione abstinere.

Interim Tertianae intermittentes increbuerunt, prioribus maligniores, adeo ut primis tribus quatuorve diebus, Autumnalium more, febres continuas aemularentur; ubi deferbuerat primus aestus, se aut simplices aut duplices Tertianas esse probabant, quae fortioribus remediis, quam illae mensis Augusti, erant superandae: resistere non potuerunt Vomitorio & Salibus, aut Peruviano Cortici. Ardentes acutissimaeque etiam insurrexerunt febres, conjicientes aegrotos in magnum discrimen, nullosque, nisi vi ex Orci faucibus ereptos relinquentes, plurimos trucidantes: puellam 6 circiter annorum visitavi, quae tam ardenti febre laborabat, ut 3 ab invasione die non modò deliraverit, sed sanguinem ex ore, naribus, ano, pudendis copiose deposuerit, & intra diem 4, miseris convulsionibus tentata, animam efflaverit.

Jam Variolae vires sumpserant, & plerumque erant confluentes, 8 & 9 die enecantes plurimos, foedamque edentes inter infantes, adultosque stragem: nondum tamen ad summum malignitatis fastigium increverant quemadmodum sequentibus mensibus.

Inclinatio acus maxima fuit 72° 30′. Minima 71° 45′. Declinatio maxima 13° 40′. Minima 13° 11′.

Per totum *Octobrem* anginae fuerunt, magis aquosae mucosaeve, quam Inflammatoriae, cum vix febris, aut exigua modo eas comitabatur, amygdalae imprimis tumebant, propendente quoque Uvulâ: curabantur satis facile fortiori alvi purgatione, atque calefaciente emplastro, faucibus circumposito.

Dysenteria hinc inde dabatur, nequaquam lethifera, & solâ radicis Hypecacoannae dosi feliciter curata.

Tertianae sive simplices, sive duplices, nec erant copiosae, nec pertinaces, septem periodis plerumque terminatae, levioribusque remediis obedientes.

Quot non circa finem *Octobris*, post-diem 26 Coryza afficiebantur? Magna profecto civitatis pars: nec febris aberat propter insignem

Schneiderianae membranae inflammationem, cauſam accuſabant omnes frigus nocturnum vigeſimi ſexti, quo gelu ſaevierat notabile.

Verum Variolae praecipua morborum pars ah quam parvae, quam confluentes, quam malignae, quam lethales erant! Strages edebant in civitate dolendas. Qui evaſerunt, quam deturpatâ foedati facie, perpetua peſſimae hujus luis geſtare debuerunt toto vitae curriculo ſigna!

Vigeſimi primi veſpera Auroram Borealem, ſed exiguam notavi, in qua nihil inſolitum: in ipſo ſeptentrione ex nube arcuata, parum ſupra horizontem elevata lucidae, uti fieri ſolet, ſurgebant columnae, nec alte adſcendentes, nec multum fulgentes, ceſſavit totum phaenomenon intra horam, incepit 7 ¾ veſpertina. In litteris curſoriis proditum eſt, eodem die in Italia Auroram Borealem fulſiſſe.

Maxima acus Inclinatio fuit 72° 30′. Minima 70° 45′. Declinatio maxima fuit 13° 48′. Minima 13° 20′.

Novembris 16 ſplendidiſſima emicuit, cui nullam parem vidi, Aurora Borealis; ſive magnitudinem, ſive fulgorem, ſive miros apparitionum diverſiſſimarum luſus conſiderem: quamobrem paulo prolixius eam à me obſervatam exponam: Maxima fuit haec Aurora, obſervata in plurimis Hollandiae urbibus, Leidae à Zumbachio, Rotterodami ab Anonymo, hic deſcriptionem inſeruit Litterariis Diariis hujus anni, alter in Diſſertatione Phaenomenon explicuit. Spectata quoque fuit Berolini à Kirchio, ejuſque obſervationibus Aſtronomicis inſerta. Circa horam veſpertinam 8 Phaenomenon detexi; tum occupabat plagam Coeli Boream, Orientalem, Auſtralem; ſola Occidentalis tum immunis erat. Coelum erat ſerenum, verum alba & opaca nubes 15 alta gradus ſupra horizontem incipiebat à Borea, extenta abhinc ultra Ortum, verum obliquo in horizontem terminata margine, ita ut inter Ortum & Auſtrum infra eum deſcenderit. Haec Nubes ejaculabatur albas, lucentes, non tamen admodum claras, virgas: quarum aliquae ad Zenith directe ferebantur, aliae oblique: aliquando ſibi in Zenith occurrebant, quae ex varia adſcenderunt plaga, tum vorticali actae motu in gyrum, petebant Auſtrum, Occaſum, aliamve inter hos mediam plagam, prolapſae quaſi verſus horizontem: ſaepius hoc ab aliis in Auroris Borealibus contigiſſe traditum eſt. Jam vero in plaga Orientali ingens & minax ſtabat perpendiculariter ad horizontem erecta columna ignea; haec ſex lata gradus, 45 alta videbatur. Magna ejuſmodi moles non tam fugax, ac leviores radii, breviſſimae plerumque durationis: haec plurium minutorum ſpatio immutata perſtabat figurâ & magnitudine; lento tamen motu verſus Auſtrum ferebatur, elapſoque horae quadrante è conſpectu evanuit: Eodem tempore in Auſtrali coeli plaga, ſub altitudine circiter 24 graduum, duae jacebant ardentes columnae, horizonti parallelae, magnae, latae, in longitudinem exporrectae, quarum una extremitas ſpectabat ortum, altera occaſum: ita trium Minutorum ſpatio ſpectabantur, tum lente ad ſe accedebant, miſcebantur

ambae

ambae in unam, deinde duobus elapsis minutis penitus evanuerunt, nullum sui vestigium relinquentes, coelo ibidem loci manente sereno. Verum pulcherrima phaenomena visebantur horâ 9 ½. Quippe latissima columna perpendiculariter supra horizontem assurgebat, in parte coeli à Borea 20 gradibus versus ortum, haec candentis ferri instar rubebat, densior aliis albentibus virgis, vix enim primae magnitudinis stellam per eam spectare potui; renovata fuit haec saepius, ita ut cum ejusmodi columna 5 vel 6 minutis fulgebat, quia nova surgebat continuo, ultra horam duraverit: eodem tempore ex ipsa septentrionali plaga assurgebat Zenith versus, lucis albissimae multum fulgentis Virga, ubi nubi adhaerebat clarissima, obscurior quo altius adscenderat, hujus latitudo multo minor priori: promovebatur lente à Borea per ortum, versus Austrum, situ sibi parallelo. Hora 10 undique coelum ardebat, certabantque de clariori fulgore inter se quatuor mundi plagae: nunc enim quae siluerat huc usque coeli pars, Boream & Occasum inter, evomebat vario tempore plurimos lucidissimosque radios, delatos partim versus Zenith, partim obliquo situ in horizontem à septentrione versus occasum; momento post insurgente vento jucundissimum dabatur spectaculum, cui simile nec antea nec postea vidi unquam: Aurorae Borealis materia haeserat huc usque supra eum aëris tractum, in quo regnabat ventus Euro-boreus: adscendens parumper ventus, lambebat inferiorem Borealis Aurorae partem, abrumpensque portiones hinc inde, effecit, ut interruptis coruscationibus, in undarum trementium modum, celerrime promotis coelum fulgeret: in plaga Orientali ultra horam hoc contemplatus fui, non quod semper aderat, sed nunc videbatur, per 2, 3ve minuta silebat, renovatum mox, atque interruptis micabat vicibus. Utinam omnia, quae simul aderant phaenomena notare potuissem! Verum centum oculi sat negotii ad id habuissent, totidem simul dabantur, cumque ad unam plagam direxeram aciem, multa interim in aversa parte contingebant. Post horam 10 in plaga coeli Occidentali usque ad septentrionem 3 nubium atrarum series, diversae altitudinis, supra se positae, oriebantur. Infima erat arcuata, cruribus horizontem versus inclinatis; aliae binae series, distinctae à se mutuo, rectis finibus, horizonti parallelis descriptae erant: ex his quasi pectinatim emittebantur breves, vixque lucentes radii, hinc inde nonnunquam fulgentior exibat, multo longior, quam jurasses fumum fuisse lucidum ex camino magno cum impetu propulsum. Hora undecima coelum adhuc ab omni parte micabat, potissimum plaga Australis, non quod ex Austro columnae assurgebant versus Zenith, sed à Zenith versus horizontem deprimebantur, agitatae nempe per ventum Borealem à septentrione per Zenith versus Austrum: increverat jam ventus ad impetus gradum secundum, quo lente minui spectacula videbantur, non adeo frequentes generabantur columnae, brevioris erant constantiae, citius provolvebantur, donec

hora 12 coelum nubibus incepit obduci, brevi poſt iterum ſerenum, aſt multo minus fulgens quam antea : hora tandem 2 poſt mediam noctem omnia ceſſaverunt, ſuperſtitibus partim nubibus denſioribus, partim albis, haerentibuſque in plaga Occidentali, Borea, & Orientali, ad altitudinem circiter 45 Graduum ab horizonte, reliquo coelo manente ſereno : vigente hoc ſpectaculo adeo lucebat coelum, ut litteras majores diſtinguere potuerim, fere aequae facile ac nocte ſerena fulgente luna, nondum plena : cum totum ardebat coelum, nullibi umbrae ab aedibus projectae : Contigit hoc Boreale lumen poſt Ventum Auſtralem impetuoſiſſimum, qui noctu praecedente ſaevierat.

Animadverti hoc menſe nonnullos Rheumatiſmos, qui vulgaribus ſtipati ſymptomatibus, aliquando auſcultabant remediis, interdum tamen è medio tollebant decumbentes, morbosâ materiâ raptâ in Cerebro, aut in Inteſtinis : Pleuritis quoque adfuit, ſed benignae indolis, & repetita Venae ſectione, refrigerantibus diluentibus auxiliis ſatis facile profligata : Verum cum horrore Variolarum reminiſco, quae adeo peſtilentes & malignae, ut nunquam forte ullibi terrarum pejores, nulla fere ab iis intacta domus in hac civitate : Solent menſis *Novembris* ſingula ſeptimana efferri 20, aut ad ſummum 25 ad funera : ſed quot nunc efferebantur à Variolis proſtrata ! prima ſeptimana numerata ſunt 65 : altera dabantur 74, tertia 69, quarta Septimana 59. Quo tempore peſtis in hac urbe maxime ſaeviit, tradentibus annalibus tot homines qualibet ſeptimana diem ſuum non obiverunt. Variolae proſtraverunt aliquos 4, 5ve die à primâ invaſione : alios 8, 11, 14, 16, imo poſt menſem, cum nempe tabe computruerant corpora. Qui evaſerunt, Orci faucibus proximi fuerunt omnes : perierunt ſubito nonnunquam, quibus Variolae benignae optimiſque cum ſignis : incolumes evaſerunt alii, quibus omnia peſſima, & gangraena correpta videbantur : nemo jam vitae alicujus aegrotantis fidebat, eludentibus perpetuo vel prudentiſſimos Medicos hiſce Variolis. Spes quidem aliquando magna, ſed preſagium certum dabatur nullum : Vidi & tractavi, quibus poſt 14 diem novae recrudeſcebant Variolae, ſatis copioſae, in facie & reliquo corpore, quae 22 die tantum ſuppuratae erant, aegro tamen ſuperſtite : Quoties non vidi Linguam, palatum, fauces gingivas adeo variolis obſeſſas, ut ne quidem locum, ſinapeos grano aequalem, liberumque inveniſſes ! ſed hi omnes perierunt : Vidi per plurimos dies depoſitas albas faeces, pure pleniſſimas, adeo ut totus inteſtinalis ductus, non niſi Variolarum armamentarium fuerit, ipſeque Cholidochus ductus ab iis obſeſſus, clauſuſque, aliqui horum perierunt, alii in priſtinam ſanitatem reconvaluerunt : plurimorum aegrotantium accuratiſſimas conſeripſi hiſtorias, ut ipſe mirum morbi genium addiſcerem ; ſed prolixiores ſunt, quam ut his Ephemeridibus inſerantur. Utinam quis adeo beatus, qui huic contagio ſpecificum inveniſſet remedium : poſtquam varia tentaveram, animadverti, feliciores fuiſſe aegrotos, qui ſibi relicti manus medicas reſpuerant ; hinc qui nihil agendo Medicinam exercebat,

plurimos

plurimos servabat. Nonnulli aegrotos infuso foecum ovinarum officiociſſime necabant ; alii ſpiritubus acidis, uti Nitri, illove dulcificato, vel Oleo Vitrioli Ptiſanis, &c. nequaquam feliciores: aeque nocebant calefacientia, ſudorifera, quam diluentia, refrigerantia: Venae ſectio primis diebus ante eruptionem puſtularum, fere certo lethalis: pudet pigetque plura de hoc morbo, cruce & infamia medicorum, commemorare.

Inclinatio acus maxima fuit 72 graduum, minima 70° 35′. Declinatio maxima 13° 28′. Minima 13 grad.

Decembris fuit admodum pluvioſus, nec memini quatuor annorum ſpatio, quibus obſervationibus hujuſmodi ſollicite operam impendi, tantum pluviae copiam ſtillaviſſe, quae fuit 4 ½ pollicum. Baroſcopium ſexto die humilius concluſit Mercurium, quam unquam intra 4 annos fuit ſcil. ad 27 poll. cum 10 lineis.

Variolae adhuc dominari pergebant, uti ſuperiori menſe, minus tamen lethales, quoniam ſubjectorum, in quos ſaevire poterant, parcior copia. Circa medium *Decembris* aliquae repullulabant Tertianae, ſed exquiſitae, benignae ; quemadmodum etiam Pleuritis fuit, paucos interimens cives, neque ullis ultra ſolitum ſtipata ſymptomatibus.

Inclinatio maxima acus hoc menſe fuit 72° 48′. Minima 71° 10′. Declinatio maxima 13° 21′. Minima 13° 13′.

Tota quantitas pluviae hoc anno delapſae altitudinem perpendicularem habuit 25 poll. 1 ¼ linear. Rhenol. Quantitas aquae, quae in vaporem abiit ex vaſe aperto & ſupra deſcripto fuit aequalis 32 poll. 2 ¾ linear. Rhenol. Rogat quis merito, majorne aquae copia in auras adſcendat, quam relabatur, ubinam haec maneat? Conſideret hic, ex Aquâ quidem à nobis obſervatam adſcendere copiam, non vero ex Terra, in quam tamen relabitur pluvia, ſi proinde copia pluviae in his regionibus deciduae, originem quoque in ipſis habuiſſet, & tanta Terrae quam Aquae ſuperficies fuerit, fere duplo major Aquae copia in auras ſub vaporum forma adſcendat neceſſe eſt, quam ſub pluviae ſpecie relabi videtur. In his terris non ſolum id obtinet ut plus aquae evaporet, quam pluit : idem, enim notante de la Hirio in Academiae regiae Pariſinae Monumentis Anno 1703, in Gallia obſervatur.

Quicunque obſervationes Magneticas intuetur, non poteſt non admirari viciſſitudines Inclinationis & Declinationis, quibus quotidie acus Magneticae ſubjiciuntur in eodem Terrae loco : hinc nunquam poterit nauta ex Declinatione acus ante aliquod tempus cognita, concludere ſe eſſe in eodem loco, cum eandem Declinationem obſervat : Quam irregulares vero ſunt mutationes? Nequaquam cum Atmoſphaerae mutationibus, ſive ejus calorem, pondus, motum ſpectes, conſentiunt : quamobrem cauſa, quae dirigit Magnetem in ipſo Terrae gremio, non ſupra ipſam, quaerenda erit : haec neceſſario perpetuis ſubjecta erit motionibus, quibus acus chalybeae in ſuperficie Terrae obediunt. Examinatis totius anni obſervationibus dubitavi, an

an quidem unquam mortales eo usque Magneticam doctrinam promoturi sint, ut declinationes certis regulis adstringere queant, easque ad stata tempora praedicere pro qualibet Terrae regione : Nihilominus nec inutile, nec injucundum erit ejusmodi observationes colligere, quia casu aliquando plus indicabunt de causa, quam sperare possemus.

Continued by the same, for the Year 1730. N° 426. p. 408.

2. Si per totum Terrarum orbem unanimi opera Meteoris observandis notandisque incumberent Philosophi, brevissimo tempore Historiam ventorum, anniversariorum, liberorum, constantium, motionumque absolutam haberemus, qui enim Ephemerides, ubivis conditas, inter se compararet, originem cujuscunque venti, iter quod absolvisset, ubinam desiisset, manifesto detegeret : videret hic quomodo à ventis nubes versus quasdam delatae plagas ab oppositis ventis fuissent condensatae, aut ab aliis admistis nubibus, ex diversissima terrae regionae generatis, debebant producere pluvias, novos ventos eorumve impetus intendere, effervescentias suscitare, fulmina incendere & tonitrua ; quorum omnium causam nunc tantum conjectando assequimur, aut ignoramus : Videret harum Ephemeridum spectator universae Atmospherae fabricam, & indolem ; de quâ vix aliquid hucusque propter observationum penuriam cognoscimus. At dolendum pauciſſimos ejusmodi Ephemeridibus conscribendis eruditos operam navare, adeo ut vix ex hac alterave comparata inter se multum lucis utilitatisque capi queat : excitavit acutissimus *Jurinus* Epistola invitatoria aliquos, qui alacri animo hunc laborem non detrectarunt : gavisus fui Lipsiae diligentissimum Philosophum accuratissimas Eruditorum actis inseruisse Anni 1730, Observationes Meteorologicas, quae cum nostris comparatae ostendent, quantum eodem die variet Lipsiae & Ultrajecti Atmosphera, quam discrepantes regnaverint Venti : quantum gravitas incumbentis aëris major huic quam alteri loco fuerit, quae cuncta spectatorem voluptate certo certius perfundent : speranda in posterum meliora tempora, quibus plures Ephemerides simul lucem adspiciant, nunc ad nostras nos convertamus.

Januarius admodum moderate friguit, exhibuitque plurimos serenos dies ; gelavit, sed cum frigidissima erat tempestas, Thermometrum modo subsedit ad gradum 18, idque semel tantum. Fuit Mercurius in Barometro die 21 ad altitudinem 29 $\frac{10}{12}$ poll. quae tanta est, ut non meminerim me eam unquam majorem animadvertisse. Coelum adeo pulchrum & serenum nec magnis nec subitaneis mutationibus caloris obnoxium fere omnes à mortalibus aegritudines proscripserat, si Variolas excipiamus, quae confluentes, malignae, ejusdemque indolis erant, ac sub finem elapsi anni notavi, pauciores tamen, quos invaserant, interfecerunt. Acus Magneticas in eodem reliqueram statu ac praeterito anno, nolens eas vi nova, ductu supra Magnetem, impregnare : mansit vis Magnetica per totum annum in Inclinatoria acu satis vivax, quid Declinatoriae contigerit mense Maio, infra notabo.

Maxima

Maxima inclinatio hoc menſe fuit 73° 25′. Minima 72° 45′. Declinatio maxima 13° 21′. Minima 12°. 58′.

Februarius ſatis humidus fuit, moderate frigidus, pauciſque aquilonaribus agitatus, nullae in Atmoſphera magnae aut ſubitaneae caloris frigoriſve viciſſitudines, unde pauciſſimi aegrotantes: Variolae tamen manſerunt confluentes, minus malignae prioribus. Die 15, hora veſpertina 10 Auroram Borealem detexi, ſive nubem modo lucentem, nullos vibrantem radios; cum nihil inſoliti continere videbatur, ipſi ulterius obſervandae non impendi tempus aut operam: vidi in Britannorum Actis Philoſ. eodem die Genevae Auroram Boream placidiſſimae lucis ſpectatam quoque fuiſſe, ejuſque elegantem deſcriptionem cum Societate communicatam in N° 413. p. 279.

Inclinatio acus maxima fuit 74° 10′. Minima 73° 15′. Declinatio maxima 14° 6′. Minima 13° 8′.

Admodum pluvioſus fuit *Martius*. In Baroſcopio Mercurius plerumque humilis, nullae tamen tempeſtates ſaevierunt, quibus caeteroquin hic menſis infamis evaſit. Aquilonares pauciſſimi ſpirarunt, hinc ſalubre coelum, vix morborum ſemina afferens diſpergenſve: Jam mitiores evaſerunt Variolae, diſcretae hinc inde dabantur, neque confluentes adeo copioſae, aut lethales quam ſuperioribus menſibus. Sexto die horâ veſpertinâ 8 Auroram Borealem ſpectavi; hac exigua erat; nubes in plaga ſeptentrionali parva, 10 gradibus ſupra horizontem elevata, inaequali terminata limbo ſuperiori, alba ſuperius, nigrior inferius, virgas aliquot emiſit lucentes, breves vix 30 gradibus ſupra horizontem elevatas, quae ſe mutuo excipiebant, interjecto tamen notabili temporis intervallo, quo nihil apparebat: hora 10 nullum amplius ejus veſtigium dabatur.

Inclinatio acus maxima fuit 75 grad. minima 66° 15′. Hic tamen aliquid mirandum contigit, cum enim 25 die inclinatio erat maxima 75′ graduum, poſtero die fuit tantum 66° 15′. Nulla tamen hujus diſcriminis cauſa in aedibus meis fuit, eſtque haec acus Inclinatoria illius indolis & probitatis, ut ſi ex ſitu ſuo turbatur, intra horam eundem Inclinationis gradum oſtendat, quemadmodum pluribus ſpectatoribus, atque inter eos nuper Sagaciſſimo *J. Th. Deſagulierio* me amiciſſime inviſenti oſtendi. Magis admirabar hoc Inclinationis diſcrimen, cum acus altera, quae Declinationem oſtendit, modo unius minuti differentiam exhibuerit: Quot non reſtant in Magnetica ſcientia à poſteris enucleanda? Inter omnes obſervationes hujus menſis in acu Inclinatoria captas, magnas mutationes obſervavi, nunquam vero vidi minores aliquo menſe, quam fuerunt illae in acu Declinatoria.

Laetus, moderate ſiccus ſucceſſit menſis *Aprilis*, cujus grato calore laete germinabant arbores & plantae, ita ut opima meſſis ex ridentibus undique pratis florentibuſque & virentibus arboribus ſpe maxima haberetur: fertilia bis mugiebant tonitrua: ſemel lumen Boreale apparuit, nihil praeter ſolitum exhibens. Pauciores iterum regnabant Variolae: Vernales Intermittentes Tertianae more ſolito in Scenam

prodierunt, nequaquam pertinaces, aut malignae, nec etiam copioſae, nec inſueta ſymptomata excitantes. Hinc inde Peripneumoniam animadverti, ſed benignam, quae nonnunquam ſponte reſolvebatur, aliquando Venae ſectionem & remedia poſtulabat : pauciſſimos interemit.

Inclinatio acus maxima fuit 72° 30′. Minima 68° 45′. Iterum hoc menſe idem prodigium contigit, quod ſuperiori ; ut nempe acus ex Inclinatione maxima redierit ſequenti die ad minimam : acu declinationem oſtendente vix ulla interea temporis mutatione agitata. Declinatio maxima fuit tantum 13° 7′. Minima 12° 46′. Tantopere motu retrogrado acus nautica hoc menſe delata fuit.

Quoties menſe *Maio* non mugierunt tonitrua ? Vix id frequentius ullo tempore obſervatum fuit : eſt tamen Maius in his regionibus ſemper tonitruum ferax ; quippe tellus frigore praeteritae hyemis conſtricta, vix exſpirare ex ſe olea, ſulphura, ſalia potuit : ſimul ac idcirco calore Aprilis & Maii aperitur, affatim in Atmoſpheram exhalationes aſſurgunt oleoſae, ſalinae, diverſiſſimaeque indolis, quae permixtae ſecum, efferveſcunt, inflammantur, fulmina fulgura & tonitrua excitant.

Spiraverant in menſis principio Aquilonares Venti, ilico hinc Anginae & Tuſſes oriebantur ; Inflammatoriae erant Anginae omnes, Amygdalae admodum tumentes & rubrae ; nonnullae Synanchae, aliae Cynanchae erant : nec niſi larga repetitaque Venaeſectione purgatione, faucium fotibus externis, gargariſmatibus, diluentibuſque potibus profligari poterant : Tertianae quoque ab hoc Vento crebriores ; eo enim inimicior corpori humano hoſpes vix datur : aderant adhuc Variolae, ſed pauciores mitioreſque.

Inclinatio acus maxima fuit 72° 25′. Minima 70° 45′. Declinationem obſervavi uſque ad diem 19, quo hora 11 ante meridiem fulminaverat, vidi fulmen ſupra aedes, ſed tamen in altiori coeli parte tranſiiſſe, ita ut nullam actionem ab ipſo exſpectaverim ; hora 12 venio obſervatum in horto, quomodo ſe declinatio acus Magneticae haberet, ſublato operculo avocor quodam caſu, interim exigua pluviae copia, vix memoranda cadit, quae parumper vitrum, quo acus tegitur in capſula, ipſamque acum humectaverat ; abſtergeo accurate, impono ſtylo, quid noto ! paralytica evaſerat quaſi acus, vi orbata Magnetica, quieſcens ſemper quocunque in ſitu poneretur : duco ſupra egregium Magnetem hanc acum, bene impraegnari noluit, cum nunquam verſus plagam, ad quam aliae acus ſuper eodem Magnete ductae, diregebatur : capituli cavitatem polivi, purificavi, applicationem acus ad Magnetem repetii, aeque vano cum ſucceſſu : tum ad dexterimum fabrum Amſtelodami miſi, qui cum ante biennium ipſam mobiliſſimam fecerat, nunc irrito conatu variis temporibus reſtituere eam cupiebat ; ſed non potuit coactus fabrefacere novas : excurrit idcirco multum temporis, quo Declinationem acûs notare non potui, atque ideo hiulcum harum obſervationum ponere coactus fui.

An hic effectus à fulmine? Affirmari non audeo, sed contigit tempore fulminis, quod si acum tetigisset, explicari ex analogis observationibus, quas in Dissertatione de Magnete collegi, utcunque posset.

Junius paucos exhibuit serenos dies, temperatus admodum, hinc morbi acuti rariſſimi fuere, Tertianae intermittentes adhuc dabantur, sed benignae satis, & facillimae curatu, jam pauciſſimae Variolae, quae ultra annum saevierant. Inclinatio acûs maxima fuit 74° 31′. Minima 71° 50′.

Maxima maduit *Julius* pluviae copia, unum alterumve serenum modo exhibens diem: calor multo minor erat, quam quem Cerealia aut fructus arborum ad maturitatem legitimam postulabant: inundabantur pascua, imo quae nunquam aquis obtecta fuerunt, jam oceani faciem, ad altitudinem duorum pedum sub aquis demersa, induerant: Fluvius Lecca ad summas usque oras impletus, transcendisset aggeres, nisi vigilatum prudenti praefectuum consilio & industria fuisset: jam desperare colonus de messe, anxiusque altiora pro pecore pascua quaerere. Non tamen ubivis terrarum hic mensis aeque pluviosus, consule Richterianas observationes circa Lipsiam captas, serenos fulsisse saepe Soles invenies, imo & ita in Gallia se habuit tempestas. Utcunque humescebat *Julius*, morbos tamen non produxit, soletque hic mensis plerumque Æsculapii filiis ferias aliquas largiri.

Inclinatio acûs maxima fuit 77° 25′. Minima vero 72° 15′.

Fuit *Augustus* quoque in principio admodum humidus; computruerunt ex arboribus mala pyraque, quorum fructuum in Trajectina Diocoesi magna penuria: quam deploranda seges! grana tritici exigua, plurimum furfuris, parum farinae concludentia, maxima pars propter pluvias continuas germinaverat: collecta haec Ceres vix emptores invenit, quippe mensura, quae 7 ½ florenis vendebatur praeteriti anni tritico impleta, vix 3 florenis extrudi potuit. Incipiebant Tertianae intermittentes, Autumnalium more, sed satis benignae. Fuerunt quoque Synochi, simplices, sed qui nulla symptomata singularia, aut decursum extraordinarium habuerunt. Inclinatio acûs maxima fuit 76° 30′. Minima 70 graduum.

September iterum pluviosus, pulchros tamen dies aliquot in initio conceſſit, post 12, nullum amplius. Aurora Borealis fulsit 10 die, vespera ab hora 10 ad 11, ex nube vix supra horizontem in parte Borea lucentes virgas ejaculans, nihil insoliti edens.

Jam plures Tertianae & Quartanae Febres intermittentes visebantur, non tamen mali moris, caeteroquin quia temperatus calor, vix alii morbi acuti regnabant.

Inclinatio acûs maxima fuit 70° 30′. Minima 69° 15′.

Octobri coelum pluviae maxima parte orbatum purgatumque quidem, sed frigidius propter humidum praeteritis mensibus solum; pauci quoque sereni dies, hinc non maturuerunt in nostris Terris uvae: in Gallia contrarium obtinuit, ubi September & October satis calidi excoxerunt egregie uvas, suppeditaruntque Vinum generosiſſimum,

& praeſtantius quam aliquibus anteactis annis. Pauci quoque hoc menſe morbi, aliquot Tertianae ſimplices, duplices, Quartanae quoque, non pertinaces.

November pluvia abundans, temperate tamen frigidus: & quia totus annus humidior frigidiorque ſolito fuit, boves in paſcuis laetiſſime veguerunt, pinguiſſimae factae, nec aliter ſe habuerunt Aves omnes, gallinae, ferae quaelibet, adeo ut fructuum damnum obeſioribus bobus reſarcitum expertus fuerit colonus. Quinto & ſexto die Auroram Borealem obſervavi, nihil inſoliti exhibentem : fuerunt hae binae hujus anni ultimae Aurorae, adeo ut fulſerint ſexies : intuendo omnes animadvertebam, non curare has Auroras quinam venti ſpirent, ex quacunque etiam plaga. Cum tamen in plagis Boreis primum ſemper apparent, indeque verſus Auſtrum ferantur, earum materia altiori in aëris regione natat, quam in qua venti inferiores dominantur : promoventur autem Aurorae à Borea verſus Auſtrum, proculdubio à vento ſuperioris Atmoſphaericae regionis hac directione latae.

Jam Inclinatoria acûs maximae depreſſa fuit ſub horizonte, quando cum eo angulum 69° 30′ fecerit, minime ſub angulo 68° 50′.

Decembri notanda eſt ſubitanea ponderis Atmoſpherici mutatio, cum enim vigeſimo ſecundo die Mercurius nocte in Baroſcopio ſuſpendebatur ad 28 $\frac{8}{12}$ pollic. mane adſcenderat ad 29 $\frac{1}{2}$ pollices. Quae mutatio intra 8 horas contigit.

Inclinatio acûs maxima fuit 69° 25′. Minima 67 graduum.

Fuit aër poſteriori ſemeſtri hominibus ſaluberrimus, ita ut pauci morbi, paucique diem ſuum obierunt, imo niſi prioribus hujus anni menſibus Variolae plures ſolito extinxiſſent, ſolito parciora funera texiſſet humus.

Pluviae copia, que hoc anno cecidit, perpendicularem altitudinem 33 pollicum, 5 $\frac{1}{3}$ lineas aequavit : In vapores autem modo abierunt 28 pollices, 1 $\frac{1}{3}$ lineae : adeo ut plus pluviae ceciderit, quam evaporatum fuerit, quod oppido raro, ſed id evenit, quia annus frigidus humidiſſimuſque fuit.

Continued for the Year 1731, by the ſame. N° 426. p. 417.

3. *Januarius* Frigus moderatum attulit : quae notari merentur hoc menſe, ſequentia ſunt : gelabat diebus 14, 15, 16, 17, parum quidem, gelabat tamen, erat vero Mercurius in Baroſcopio admodum depreſſus, venti ſpirabant Auſtrales, ſed pigri : mirabar hoc, cum vix aut nunquam gelu inchoaſſe animadverterim Baroſcopio adeo depreſſo iiſque comitantibus ventis, deſiit admiratio ſimulac perceperim in littoribus Luſitaniae & Hiſpaniae ſaeviiſſe impetuoſiſſimas procellas, plurimas frangentes naves triſtiſſimae Tragoediae cauſas : dominabatur ibidem Ventus Auſtralis, qui quoque inde delatus ad noſtras uſque regiones, ſuas vires in aërem noſtrum exercuiſſet, niſi Boreas oppoſita directione ipſi reſtitiſſet ; aër inde piger & tranquillus, quemadmodum Luctatores pari niſu, ſed oppoſito, in ſe agentes quieſcunt : ſuperante Auſtro, hic flare obſervabatur, ſuperante Borea hunc regnare vidimus. Quam ſobrie de futura atmoſphaerae conditione ex altitudine Mercurii in Baroſcopio ratiocinandum eſt ! quippe

pe 26, 27 & 28 die hujus menſis regelabat, Mercurio jam perquam alto exiſtente ; & flante Vento Orientali : vix credo aliquem majores circa Barometrum Anomalias obſervaſſe unquam.

Variolas obſervavi aliquas, paucae fuerunt, plerumque diſcretae, quibus pauci infantes perierunt. A medio Januarii inceperunt Pleuritides, corripientes modo Operarios & ruſticos, mitioris indolis, raro in ſuppurationem tendentes.

Fuerunt quoque Tertianae duplices, quae ſolo ſalium aut Amarorum uſu brevi & feliciter curabantur.

Simulac regelabat, Coryzae exſtabant. Lecca fluvius hoc menſe parcam aquae copiam in ſe complexus fuit.

Jam mihi nova aliquot Verſoria comparaveram, ut iterum Declinationem Magnetis obſervarem : Acum Inclinatoriam ſibi reliqueram, viſurus an vis Magnetica, ante biennium cum ipſa communicata, adhuc anno hoc ſatis vegeta perſtaret ? Docuit experientia vim ſummopere hoc anno decreviſſe ita ut menſe Decembri acum denuo ſupra Magnetem ducendam eſſe judicaverim, noviſque his imbuta viribus multo magis inclinabat, ſuſpicor tamen vires ſatis ipſi conſtitiſſe uſque ad menſem Junium : Hiſce detectis arbitror nunquam nautas tuto ſuis confidere Verſoriis poſſe, quae ultra biennium Magneti applicata non fuerunt.

Inclinatio maxima acûs hoc menſe fuit 68 graduum, minima 67° 20′. Declinatio maxima 14° 55′. Minima 14° 15′.

Februarius diuturnum gelu, ſed moderatum, comes habuit ; id incepit die 2, & abſque interruptione gelavit uſque ad finem 21. Poſt ſextum diem Mercurius in Barometro deſcendit, donec ad infimam fere ſtationem ſui die 8 & 9 pervenerit ; coelo utcunque ſereno, placidis ventis, ex quacunque afflantibus plaga, perſtante gelu : ſed ejuſmodi anomaliis luxuriare inceperat, pergere ita ſtudebat annus. Nocte diei 5 valde fulguravit, in aliis Hollandiae urbibus ferocia micuerunt fulmina, & tremenda mugierunt tonitrua, praecipue ſupra pagum Alſmeriam ; 12 die cecidit veſperi intra horam 6 & 8 ingens nivis quantitas, quae altitudinem 15 pollicum aequavit, cum admiſta pluvia rara & tenuiſſima, tam prodigioſam nivis copiam intra breviſſimum tempus delapſam in hac regione nunquam obſervavi : Nivem ſolvi, ſoluta dedit 20 aquae lineas : haec nix proinde modo novies rarior aqua erat : contigit hoc prodigium nocte praecedente Lunae quadraturam. Ob continuatum gelu Fluvius Lecca obriguit ; poſt diem vigeſimum blandiſſime regelavit, ſoluta feliciter fluviorum glacies nullam cladem aggeribus intulit.

Hoc frigore durante ſiluerunt fere morbi : Variolae fuerunt, ſed benignae, diſcretae, vix quemquam è medio tollentes. Copioſa nix cum ſubſequentibus aquilonaribus poſt diem 12 Arthritidem excitavit, quae ſaevior fuiſſet, ſi aut majus regnaſſet frigus, aut Boreas diutius infeſtaſſet ; verum clementioris genii auſtrales non exiguum ſolatium aegritudini huic attulerunt. Cum vero per longiſſimum tempus,

18 se sequentium dierum, gelu absque intermissione corpora constrinxerat, impedita in nonnullis perspiratio fuit; hinc Diarrhoeae, non prius desinens, quam abundans in corpore materies excreta fuerit, restitutaque libere perspiratio; promptissimum idcirco remedium fortis purgatio & postea blandum sudoriferum. Verum alios invasit Angina inflammatoria, diuturnior quam periculosior; profligata cito Venae sectione, imprimis repetitis purgantibus. Postquam regelare coepit, & aër pluviâ humescere, Tusses oboriebantur, austris humidioribus valde relaxantibus pulmonum vesiculas, adeo ut oscula excretoriorum laxiora, nimisque patula, huc plus liquidi non nisi tusse excreandi, demiserint.

Inclinatio acûs maxima 68° 30′. Minima 68 graduum. Declinatio maxima 14° 20′. Minima 13° 45′.

Martio mense fere semper spiraverunt Venti Aquilonares, ingrata tempestate aeque Vegetantia ac Animalia afficientes: Hinc multi morbi, Arthritis, Pleuritis, Febres acutae continuae, Tertianae intermittentes, Quartanae, Variolae: post decimum quartum diem animadverti eos, qui Phthisi laborabant, multo pejus se habuisse, valde anxios fuisse: causam suspicari poteram nullam praeter antecedentes, diu continuatos Aquilonares.

Diei 7 vesperâ Auroram Borealem observavi, exiguam, nihil insoliti ferentem.

Inclinatio acûs maxima fuit 69° 15′. Minima 68° 20′. Declinatio maxima 14° 58′. Minima 13° 30′. Inter 5 & 6 discrimen Declinationis evasit aequale uni gradui, Inclinatione manente immutatâ.

Aprilis fuit siccus, valde frigidus, plurimis aquilonaribus infestus, steriliscque; hinc mense hoc elapso nondum ulla virebat arbos, sub finem florere coeperunt mala armeniaca, verum frigore perierunt flores; mala persica dein amiserunt flores, qui multum à frigore passi, foecundiores tamen fecerunt fructus.

Jam crebriores Arthritides ingrati frigidique Aquilonares excitaverunt: jam Tertianae simplices & duplices, Vernalium more, sed copiosiores fuerunt, nequaquam tamen malignae aut pertinaces.

Inclinatio acus maxima fuit 70° 40′. Minima 68° 45′. Declinatio maxima 16 Graduum, minima 14° 25′.

Maius in principio ingratus frigidusque, verum die 5 post meridiem maxima subito contigit mutatio, ex coelo cadente calida pluvia, clementiorem reddente aërem, hinc posteris diebus catervatim ex arboribus erumpebant folia floresve, & jam plurima laeta virere nitebantur, nisi iterum à die decimo usque ad 15 noctes frigidissimae omnia iterum gelu constrinxissent; hinc nulla crescebant legumina, densa glacie obducta Terra singulis noctibus; postquam 18 die tonuerat, mitescere coelum coepit. Interim 5 die propter celerrimam atmosphaerae mutationem ex frigida in calidam, ilico

aderant

aderant Anginae, leviores tamen, ſuâ ſponte evaneſcentes. Sequenti die Colicos dolores abſque febribus notavi, hi noctu corripuerant homines antea ſaniſſimos; cauſam invenire non potui niſi in ſubitanea caloris frigoriſque viciſſitudine; neglexiſſem hunc morbum, niſi eo die mane inviſens aegrotos, primos 4, in variis aedibus tamen habitantes, de iis doloribus conqueſtos audiviſſem, tum vero ab aëre pendere ſuſpicatus, levioremque in Inteſtinis inflammationem dari; Venam ſecandam judicavi, optimo cum ſucceſſu; in quibus id neglexeram, propinaveramque ſpirituoſa calida, opiata, morbus per triduum duravit, nec niſi Venae ſectioni & diluentibus profligatus fuit. Eodem tempore frequentes oriebantur Raucedines & Tuſſes, abſque febre, quae tamen poſt mediam noctem exacerbabantur; pertinaciſſimae hae fuerunt, non auſcultantes Venae ſectioni, purgantibus, ſudoriferis, blandefacientibus; ſed tempus diuturnum poſtulabant, tum Mellita, atque Opiata.

Die 14 Lumen fulſit Boreale, quod nihil, antea non notatum ſaepius, ſpectandum dedit. Inclinatio acus maxima fuit 72° 50′. Minima 68 Graduum. Declinatio maxima 16° 30′. Minima 15 Graduum.

Junio Synochos ſimplices obſervavi, quos nulla malignitas comitabatur, ideo facile curati largâ Venae ſectione & nitroſis, diluentibus, refrigerantibuſque potulentis. Erant quoque Variolae, ſed ejus naturae, ut nunquam mitiores fuerint, aut eſſe poſſint; exoptaſſet unuſquiſque nunc ſibi, hunc morbum, ſi poſtea ſe liberum immunemque ab eodem fore, ſibi perſuadere potuiſſet; erant Variolae diſcretae, paucae, exiguae, quibus infantes aliqui non aut vix aegrotabant, nequaquam decumbere coacti; ſuppuratae jam ſexto die erant omnes puſtulae, & penitus exſiccatae nono die. Verum peſſimae Coryzae fuerunt, diutiſſime durantes, propter ingentem tempeſtatum varietatem, quippe ſi nunc regnabat magnus calor, eum poſtero die magnum frigus, ab Aquilonaribus advectum excepit. Suſpicor omnes Inclinationes, quas acus oſtendit ab hoc menſe uſque ad Decembrem, eſſe minores quam par erat, propter vires magneticas longinquitate temporis minutas.

Declinatio maxima fuit 16° 30′. Minima 15° 50′.

Julii 24 die adeo terribilia corruſcarunt fulmina, concomitantibus tonitruis admodum crepitantibus mugientibuſque, ut nunquam ſimilia viderim vel audiverim, inceperunt poſt meridiem hora 4 ½ deſiverunt hora ſexta: multa tamen damna urbi non intulerunt; hinc inde lapides ex caminis dejecti, tegulae ex tectis duae arbores prope urbem Fiſſae, & pro parte deglubitae, ubi fulmen decurrerat: tactus, qui ſub una arbore hoſpitium quaeſiverat ab hoc fulmine, civis ſuburbanus.

Jam toto hoc menſe coelum mite, clemens, ſerenum, fertile, hinc opima Meſſis, praeteriti anni penuriam compenſans; adeo ſalubris fuit haec tempeſtas, ut vix aliqui aegrotaverint. Declinatio acus maxima 16§ 10′. Minima 15° 40′.

Auguſtus

Auguſtus admodum calidus fuit, ſed coelum adeo clemens, benignum, ſalubre, ut melius exoptari à mortalibus non poſſet : hinc pauciſſimae aegritudines. Pomona vero adeo faecunda, ut nimiam protulerint optimorum fructuum & maturorum arbores copiam, & vix pretium fructibus ſteterit.

Declinatio maxima acus fuit hoc menſe 16° 5′. Minima 15° 35′.

September coelo quoque gaviſus fuit temperato & miti, paucis infeſtus Aquilonaribus : protulit anginas aliquas inflammatorias acutiores, & mitiores ; protulit quoque Tertianas & Quartanas, intermittentes, minus tamen in civitate quam ruri : Erant hae ex genere Autumnalium, non auſcultabant Lixivioſis ſalibus, aut amaris antifebrilibus : verum feliciſſime centenos curavi, propinando vomitorium, idque interdum bis, tum decoctum amarum per paucos dies, deinde Corticem Peruvianum, quâ methodo radicitus extirpatae ſunt, neque recruduerunt.

Declinatio acus maxima fuit 15° 55′. Minima 14° 20′.

October foecundus fuit in progignendis luminibus Boreis, quinque enim apparuerunt ; die 3, veſperâ ab hora 8 ultra 12 nocturnam, coelo admodum placido & quieto ingens lumen Boreum dabatur, emittens lente ſuas columnas ab horizonte verſus Zenith, quae diutiſſime perſtabant nullis interruptae ventis.

Die 7 ingens Aurora Borealis ſpectabatur, totum coelum clarius illuſtrans, quam Luna Dichotoma feciſſet, hora 7 incepit in plaga Euro-borea, ſed pedetentim proſerpſit quoque ad plagam occidentalem, ita ut ſimul micuerit per totum coeli tractum ab Euro-borea ad Occaſum, adeo exporrecta fuit hora 11 : prope horizontem coelum erat obductum nube alba, denſiori quam ut Stellarum lucem tranſmitteret : ex hac nube interdum aſſurgebat pars columnae inſtar, aliquando abrumpebatur pars nubis, inaequalis figurae, quae ita divulſa lucebat, lente promota verſus Zenith, nam nullus ventus prope terrae ſuperficiem regnabat : praeterea nihil ſingulare habuit.

Die 8 veſperi iterum fulſit Aurora Borealis in plaga coeli Borrolybica : Erant crebrae, interruptae nubes exiguae, atrae ; ſupra quas haerebant nubes pellucidae & lucentes, quietae, non emittentes radios aut columnas : duo ſpirabant ſimul venti, ſupremus erat Hypaquilo, inferior Notus. Supremi venti inferior pars incurrens in ſuperiorem nubium partem, aliquid abripiens ſecum deferebat, quod admodum rarefactum, motuque inteſtino ferveſcens lucere incipiebat : ex his abraſis partibus emittebantur interdum virgae ; ex reliquis tamen nubibus raro exibat columna, quae parum ſplendebat. Reliquae Aurorae nihil ſingulare habuerunt.

Fuit aër toto hoc menſe ſaluberrimus : hinc pauciſſimae aegritudines, niſi ſub finem menſis quo ruri potiſſimum Febres Tertianae Simplices, Duplices, Quartanaeque intermittentes : in civitate multo

pauciores fuerunt. Quoniam pomorum & pyrorum tanta ubertas hoc Autumno, ut nullo pretio haberi potuerint, vulgus iis nimium indulsit: hinc Dysenteriae, ruri praecipue, in urbe pauciores; non tamen proserpserunt, nec contagiosae fuerunt.

Declinatio maxima fuit 14° 30′. Minima autem 14 Graduum.

November. Quam temperatum, quam clemens huc usque fuit coelum! Non Autumnus, sed Æstas temperata adesse fuit visa: 10 die extra hanc urbem spatians vidi omnes adhuc arbores virentes pauciſſimaque Tiliarum folia flava decidua. Triticum Autumno hoc satum, increvit nimis, adeo ut bobus devorandum, graminis loco in pascuis propinaretur, ne magis excrescens, futurae hyemis frigus ferre melius posset. Omnes edules herbae in hortis vegebant, ut mense Augusto solent, adeo ut etiamsi sera advenerit Æstas, diutissime tamen blando suo calore terram refecerit, manseritque: fuit 26 dies ultra modum calidus, etiamsi humidus & flante Borea.

Die sexto Auroram Borealem spectavi, diversam ab omnibus, quas hucusque contemplatus sum: Erat enim coelum ab Austro per Occasum usque ad Septentrionem plurimis interruptis nubibus ornatum, quae omnes quiescebant, tranquillae suis in locis haerentes, quamvis ventus aliquis regnaret, lucebant omnes alba luce, totum coelum illustrante: Ordinaria fuit Aurora, quae 30 die comparuit. Plurimae dabantur Tertianae; duplices praecipue, & Quartanae febres intermittentes, quae pertinaces non fuerunt, feliciter enim profligatae sunt methodo supra notata. Variolae quoque dabantur, paucae sed Confluentes & Discretae, benignae indolis, paucos intermittentes, etiamsi copia pustularum notabili faciem occupaverint.

Maxima declinatio acus fuit 14° 15′, & minima 14 Graduum.

December. Cum jam acum Inclinatoriam virium suarum maximam feciſſe jacturam animadverteram, eam denuo supra Magnetem duxi, viribusque tantis ac potuit, impregnavi, ilico veram Inclinationem ostendit 69° 15′. Aliquoties ex suo loco turbata, post nonnullas oscillationes ad eundem gradum Inclinationis rediit. Declinatio maxima fuit 14° 21′. Minima 13° 23′.

Variolae hujus mensis fuerunt ejusdem generis ac *Novembri* observaveram. Praeterea dabantur Tertianae & Quartane febres intermittentes, nihil insoliti habentes, nec diversae ab iis, quas superioribus Autumni mensibus tractaveram.

Tota pluviae quantitas, quae hoc anno delapsa fuit, altitudinem perpendicularem modo habuit 17 ⅓ pollicum Rhenolandicorum, quae exigua est, fuit autem annus inter sicciores numerandus. Sub vaporis forma in auras abiverunt 27 pollices 10 ½ lin. quae copia fere est illi aequalis, quam elapso anno observaveram.

CHAP.

CHAP. IV.

Papers omitted.

[Part II. *p.* 27. *Add the following Papers.*]

Farther Experiments concerning Electricity; *by Mr* Stephen Gray, *F. R. S.* N° 426. *p.* 397.

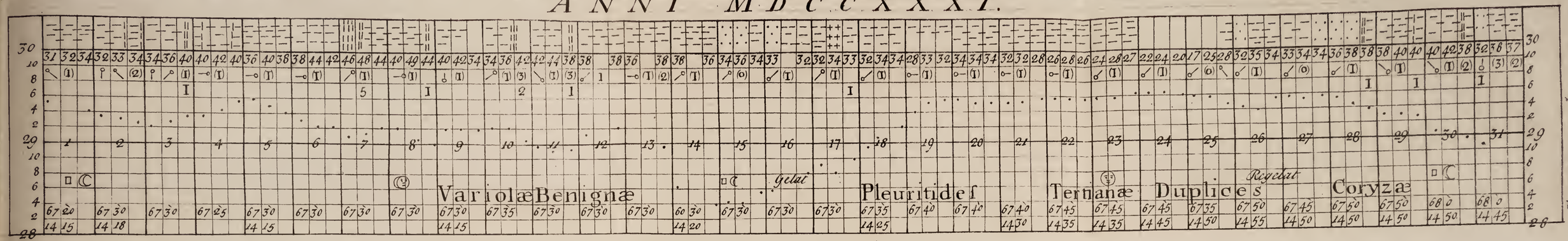
1. ABOUT the latter end of *Auguſt*, 1732, being at Mr *Wheler*'s, after having repeated the Experiment of making Sulphur attract Leaf-Braſs *in vacuo*, Mr *Wheler* having a very good Air-Pump of the larger Sort, made by Mr *Haukſbee*, we ſuſpended from the top of a Receiver, which was firſt exhauſted of Air, a white Thread that hung down to about the middle of the ſame: Then the Receiver being well rubbed, the Thread was attracted by it vigorouſly. When it was at reſt, and hung perpendicular, the Tube was rubbed, and being held near the Receiver, the Thread was attracted toward that Side of it; if the Tube was removed ſlowly, the Thread returned to the Center of the Receiver; but when moved ſwiftly, the Thread was attracted by the oppoſite Side of the Receiver: If the Hand was held near the Receiver, and moved haſtily from it, the Thread was attracted by the oppoſite Side, as before. This ſeemed at firſt difficult to account for; but upon farther Conſideration, we concluded it proceeded from the Motion of the Air made by the Tube, and in the other Caſe by that of the Hand, which took off the Attraction from that Side, and not on the other Side; ſo that, as Mr *Wheler* very well expreſſed it, by this Means the Balance of the Attraction was taken off.

We made another Experiment by ſuſpending a Thread on the top of a ſmall Receiver, and whelming a large one over it; then by firſt rubbing this, and holding the rubbed Tube near it, the Thread in the middle Receiver was attracted to that Side of it where the Tube was held.

An Experiment, ſhewing that Attraction is communicated through opacous as well as tranſparent Bodies, not in vacuo.

There was taken a large Hand-Bell, the Clapper being firſt taken out, and a Cork ſuſpended by a Thread from the top of the Bell, the Cork being ſmeared over with Honey: Then the Bell was ſet on a Piece of Coach-Glaſs which had been well rubbed, on which the Leaf-Braſs was laid; then the Tube being rubbed, and held near the Handle of the Bell, and afterwards near the Top and Side of the ſame, the Bell being taken off, there were ſeveral Pieces of the Leaf-Braſs ſticking to the honeyed Cork that had been attracted by it: It appeared alſo that ſome others of them had been attracted by the Bell, being removed from the Places they were left in when covered by it.

EPHEMERIDES METEOROLOGICÆ ULTRAJECTINÆ
ANNI MDCCXXXI.



S. PL. Lin 14
Evap Lin 3

EXPLICATIO SIGNORUM

Altitudo Barometri

Altitudo Thermometri indicatur numeris suprema in serie cujus libet mensis scriptis

(&c) Mortuorum numerus

Pluvia | Nix ++ | Grando ∴ | Nebula ∴ | Fulmen | Fulgur

Cælum rari | Nubibus pluribus | obductum densis | Aurora Borealis scribitur AB | Lunæ phases ☐ ☾ ◎ ◎ | Ventorum Vires et Plaga (1) (2) (3) (4) o—

Fig. 9

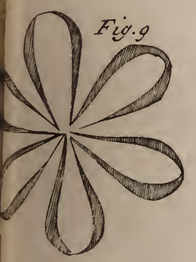


Fig. 10

Fig. 11

Fig. 12

Fig. 13

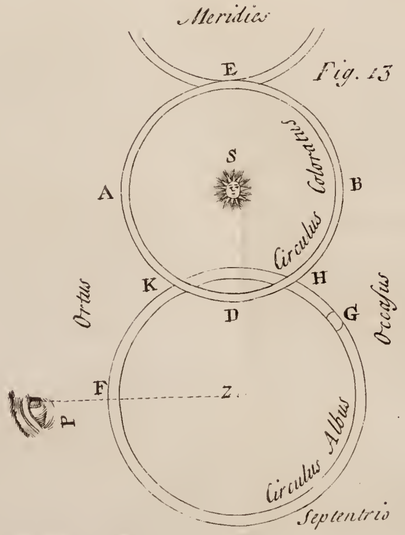
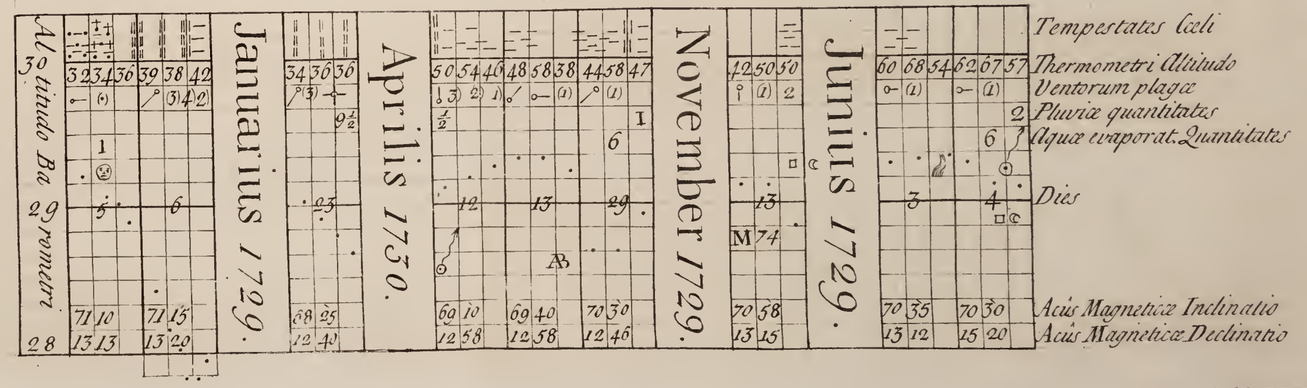


Fig. 14



Some time after Mr *Wheler* told me of an Experiment he had made *in vacuo*, when I was gone from him. He took a ſmall Receiver, and in it ſuſpended a Thread, and over this four other Receivers, all exhauſted, and the Thread was attracted thro' all the five Receivers, and he thought the Attraction was rather ſtronger than before, when a ſingle Receiver only was made uſe of; but inſtead of wet Leather, he made uſe of a Cement I had recommended to him, *viz.* Bees-Wax and Turpentine, which was what Mr *Boyle* made uſe of in his Experiments with the Air-Pump, and that, as I had told him, it was my Opinion the Attractions would be much ſtronger, the Steams of the wet Leather taking off ſome of the attracting Force.

I ſhall now proceed to give ſome Account of the Experiments made at Mr *Godfrey*'s; the firſt of which was giving an Attraction by the Tube to a Boy ſuſpended on Hair Lines, and that by the Intervention of a Line of Communication, the attractive Virtue paſſes to another Boy that ſtands at ſeveral Feet diſtant from him. But before I go any farther, it may not be improper to give an Account of that Experiment of the attractive Power that is communicated to the Boy ſtanding on Roſin; which tho' the Society have ſeen the Experiment, I have not given any Account of it in Writing.

June the 16th, 1731, in the Morning, I made the following Experiment on the Boy mentioned, cauſing him to become attractive by ſuſpending him on Hair-Lines. There was taken two Pieces of white Roſin made into round flat Cakes of ſomewhat more than 8 Inches Diameter, and 2 Inches thick. Theſe were laid down on the Floor of my Chamber, ſo near together, that the Boy might ſtand with one Foot upon one, and the other upon the other Cake of Roſin: Then the Leaf-Braſs being laid under his Hands, the Tube rubbed and held near his Legs, cauſed both his Hands to attract and repel the Leaf Braſs to the height of ſeveral Inches: Or if there was laid Leaf-Braſs under one Hand, and the Tube held near the other Hand, there was an Attraction communicated to the farther one; and when the Tube was applied either to his Hands or Feet, there was an Attraction given to his Cloaths; ſo that a Piece of white Thread being held by one End, the other End would be attracted at near the Diſtance of a Foot; ſo that the Attraction is altogether as ſtrong, if not ſtronger, than when the Boy was ſuſpended on Hair-Lines.

I come now to the above-mentioned Experiment: One of the Boys being ſuſpended on the Hair-Lines, and the other ſtanding upon the two Cakes of Roſin, the Boys holding Hands with each other, under the Boy's Hand that ſtood on the Roſin was laid the Leaf-Braſs; then the Tube being rubbed, and held near the Boy's Feet that hung on the Hair-Lines, the Hand of the Boy that ſtood on the Roſin attracted ſtrongly. Then there was taken a four Foot Rule,

and given to the Boys to hold by each End, and there was the ſame Virtue of Attraction given to the other Boy as before. After this, a Line of Packthread was given them to take hold of by the Ends, and there was an Attraction communicated from one End to the other, with as much Vigour as by any of the other Methods before mentioned. This Experiment was made *Sept.* 13, 1732.

Sept. 14 I firſt made the following Experiment. There was taken a Rod which was compoſed partly of Wood and partly Cane: It was 24 Feet in Length, and in Form not unlike two Fiſhing-Rods ſuppoſed joined together at their bigger Ends. This Rod was ſuſpended horizontal by two Threads of Silk: Over this, about two Feet from the Ends was ſuſpended a ſmall hazel Wand, about five Feet long, at right Angles to it, but not touching the Rod: Then going to the other End of the Rod, the Tube being excited and held near it, repeating the ſame three or four times as uſual, and going to the hazel Wand with a ſmall white Thread, I found that it attracted to it when held near to any Part thereof. The next Day Mr *Wheler* came to Mr *Godfrey*'s, and now, by their Aſſiſtance, I repeated the Experiment, and we found that by ſuſpending the Wand at ſeveral Heights, we could perceive there was an Attraction, when it was at the Height of more than twelve Inches. I ſhall now give ſome Account of my repeating, and of what farther Improvements I have made to ſome of theſe Experiments ſince my Return to *London*.

Sept. 29, I repeated the Experiment on two Boys, firſt ſetting one of them on Cakes of Roſin, and the other being ſuſpended on the Hair-Lines, and the Effect was the ſame as hath been above related. I then cauſed both the Boys to ſtand on Cakes of Roſin, giving them to hold a part of a *Spaniſh* Cane Fiſhing-Rod that was 8 Foot long, one Boy holding one, and the other Boy the other End of the Rod; then the Leaf-Braſs being laid on the Stand, and one of the Boys holding his Hand over it; I went to the other Boy, and the excited Tube being held near the Palm of his Hand, the firſt Boy's Hand attracted and repelled the Leaf-Braſs ſtrongly. Then there was a piece of Packthread given them to hold by each End, about the ſame Length with the Rod, *viz.* 8 Feet long. Under each of their Hands was laid Leaf-Braſs; then going to the middle of the Line, holding the Tube near it, the farther Hand of both the Boys attracted the Leaf-Braſs with ſo much Vigour, that it is not to be doubted that had the Line been much longer, they would have attracted at a far greater Diſtance. I then cauſed the Boys to ſtand on the Cakes of Roſin, ſo as to let the Flaps of their Coats touch, and then by holding the Tube to one of their Hands, the other Hand attracted, but not with more Force than when they were diſtant the Length of the Line. Then they ſtood ſo much farther as not to let their Coats touch by about an Inch, and then exciting one of them to attract, the other received not the leaſt Degree

of Attraction. I then bid one Boy put his Finger upon the other Boy's Wriſt, and then he immediately became electrical.

Oct. the 4th I made the following Experiment: A Fiſhing-Rod of about 10 Feet 8 Inches long, being horizontal, and over it, towards the leſſer End, a ſmall Rod, being the top End of another Fiſhing-Rod, at the leſſer End, which was Whale-bone, there was put on a Ball of Cork 2 Inches Diameter, the ſmall Rod touching the great one; then the Tube being excited, and held near the great End of the great Rod, applying it as uſual; then going to the Cork with a pendulous Thread, I found it attracted it at the Diſtance of at leaſt 2 Inches. Then the Rod was moved higher, ſo as not to touch the End of the long Rod, by Eſtimation about an Inch, and after ſeveral Trials there was a viſible Attraction, when the little Rod, that carried the Ball was above the great one 34 Inches.

Oct. the 5th, I took a Line of Packthread 17 Feet 4 Inches long, with Silk Lines tied to the Ends of the Packthread, one of them about 4 the other 2 Feet long, near 2 of the oppoſite Corners of my Chamber, where in each of them was driven a Hook at about 3 ½ Feet high, to which the Ends of the Silk were faſtened, drawn ſo tight as to bear the Packthread nearly horizontal: Then the ſmall Part of the Fiſhing Rod was ſuſpended over the Packthread at about 4 Feet from the End; then the Tube being applied to the other End of the Packthread, the Cork Ball at the End of the little Rod was attractive, and at ſeveral Removes, to the Height of 47 Inches, there was a viſible Attraction of the pendulous Thread.

Oct. the 6th, inſtead of the ſmall Rod, I took a Packthread about 4 Feet long, and having tied ſilk Threads to each End, by which the Thread was ſuſpended over the longer Line horizontal, and at right Angles nearly to the ſaid Line, which was by tying the Ends to perpendicular Lines of Packthread that were faſtened to Hooks at each End, and had ſliding Knots on them, ſo that the croſs Line might be moved higher or lower as there was occaſion for it; upon one End of this Line I put a Ball of Cork, and found, that when the firſt Line had been excited the Virtue was carried up to the ſecond Line, and cauſed the Cork Ball to attract. I then took off the Cork Ball, and put one of Ivory in it's Place, and this attracted after the ſame manner; and afterwards I hung two Ivory Balls, one at one end, and the other at the other end of the Line, and found there was a ſenſible Attraction when the Line that ſupported them was raiſed 38 Inches above the Line of Communication.

Oct. the 30th I repeated this Experiment, and now when the Line that ſupports the Ivory Balls was elevated about an Inch above the communicating Line, either Ball attracted the Thread at the diſtance of more than a Semi-diameter of the Ball, and at the height of 10 Inches, at leaſt half the ſame diſtance.

By theſe Experiments we find, that the electric Virtue may not only be carried from the Tube by a Rod or Line to diſtant Bodies, but that the ſame Rod or Line will communicate that Virtue to another Rod or Line that is at a diſtance from it, and by that other Rod or Line the attractive Force may be carried to other diſtant Bodies.

Continued by the ſame No. 426. *p.* 401.

6. A ſmall Hoop of about 20 Inches Diameter, and 1 ½ Inch in breadth, being ſuſpended by two Threads of Silk, ſo that it hung perpendicular, and in a Plane at right Angles to the horizontal Line of Communication, which paſſed thro', or at leaſt very near to the Center of the Hoop, I went to the End of the ſaid Line, and applying the excited Tube near it, there was an attractive Influence communicated to the Hoop in all Parts of it. Then by a Skrew-Hole made in the Side of the Hoop for that purpoſe, I ſkrewed it upon the top of a Pedeſtal that was about 2 ½ Feet in height, ſetting it upon a Cake of Roſin, ſo as that the before-mentioned Line might paſs thro' the Center of the Hoop, and found that whether the Hoop was placed ſo as it's Plane was at right Angles, or in any other Angle with the Line of Communication, the Hoop attracted after the ſame manner as it had done when ſuſpended on the ſilk Lines.

Some time after I made the following Experiment: Into the Noſe of a Glaſs Funnel I put the larger end of the top of a ſmall Fiſhing-Rod, and upon the leſſer end a Ball of Cork; then the Funnel was ſet on the Floor of the Room, ſo that the Rod was at ſome Inches diſtance from the Line of Communication; then the Tube being excited, and applied near the end of the Line, the electric Virtue was conveyed by it to the Cork Ball, and it attracted ſtrongly when the Ball was, by Eſtimation, not leſs than 2 Feet diſtance from the aforeſaid Line.

Dec. 11, there being a hard Froſt, and a fair Day, I repeated the Experiment, making uſe of a large Hoop that was about 40 Inches Diameter, and ſetting it perpendicular upon a hollow Cylinder of Glaſs, which was 6 Inches long, and 5 ½ Inches Diameter; ſo placing the Hoop that the Line of Communication might paſs thro', or at leaſt very near to, the Center of the Hoop; then applying the Tube to the end of the Line, there was an Attraction communicated to all Parts of the Hoop, attracting a pendulous white Thread at the Diſtance, by Eſtimation, of about ½ an Inch. I then ſet the Hoop ſo as the inward Surface of the Hoop might touch the Line, and then communicating an Attraction by the excited Tube to the Packthread, the attractive Virtue of it was carried by it to the Hoop, and cauſed it to attract with ſuch Force, as with the remoteſt part of the Hoop to attract the Thread at a diſtance, by eſtimation, of about 4 Inches.

Some time after the aforegoing, I made the following Experiment: The large Hoop being ſet upon the Glaſs Cylinder, and the

Packthread paſſing thro' or near it's Center, the Tube being applied near the Hoop, gave it a ſtrong Attraction, ſo it would attract a Thread at the diſtance of 7 or 8 Inches, and at the ſame time there was an Attraction communicated to the Packthread. Then I ſuſpended an Ivory Ball, of 2 Inches Diameter, at the other end of the Packthread, and applying the Tube to the Hoop, there was an attractive Virtue carried to the Ball, and it would attract the pendulous Thread at the Diſtance of near an Inch. I then placed the Ball in or near the Center of the Hoop, and now it was ſo far from being attracted, that it was repelled by the Ball, but was attracted by the Packthread paſſing to it in the Arc of a Circle, whoſe Center ſeemed to be that of the Ball.

[Part II. *p.* 80. *Add the following Article to the Accounts of* Parhelia.]

5. Martii die 11, 1725, circa horam 9 mat. Sol inter tenues nubes allucens, & colorato halone cinctus, in eo ad dexteram & laevam duo Parhelia efformabat multum reſplendentia. Duravit ſpectaculum per ſemihoram.

Two in a Halo *at* Pekin; *by* F. Ignatius Kogler. No. 405. *p.* 553.

[Part II. *p.* 220. *Add the following Paper.*]

3. A Friend from the City of *Dirſchaw* has lately placed in my Collection part of the Skull of an Ox with the Cores of the Horns, which in all probability muſt have been terrible. It was dug up near the ſaid City, which is 3 Miles diſtant from hence. I ſend you ſome Draughts thereof. *Fig.* 15, repreſents the outſide to the Orbits of the Eyes. *Fig.* 16, the Baſis of the Skull, and *Fig.* 17, the *Occiput*. The Cores of the Horns contain deep longitudinal Furrows; they are not entire at the Extremities, and yet are diſtant from one another.

A very extraordinary foſſile Skull of an Ox with the Cores *of the Horns; by Mr* Jac. Theod. Klein, *Secret. Dan. & F. R. S.* No. 426. *p.* 427.

Fig. 15. *a b.* 3 Feet 2 ½ Inches. *c d.* 1 Foot 1 ⅓ Inch. *e. f.* 1 Foot 4 Inches. *g. h.* 1 Foot 1 ¾ Inch. *i* K. The Root of the Horns 1 Foot 6 Inches in Circumference. *l. m.* the Cores 11 Inches in a ſtrait Line.

Fig. 15.
Fig. 16.
Fig. 17.

I dare not determine to what kind of Bulls this Foſſil is to be aſcribed. I only conjecture it may belong to the *Taurelephantes*, mentioned by Sir *Hans Sloane* *: For as to the *Zubrones* which *Geſner* on the *Urus*, p. 144, mentions from *Munſterus*, there is no ſufficient Proof that the Animal in queſtion was of that kind.

* *See above*, Part III. *p.* 442.

[Part

[Part II. *p.* 304. *Add the following Article to the Accounts of the Variation of the Compaſs.*]

The Variation at Vera Cruz, *in* 1726 *and* 1727; *by* Mr J. Harris. No 401, *p.* 389.

7. In 1726, and 1727, I obſerved the *Magnetic Variation* at *Vera Cruz* ſeveral times, and found it to be about 2 $\frac{1}{4}$ Degrees Eaſterly.

We alſo obſerved the Variation ſeveral times on our Voyage from *England* towards *Vera Cruz* (having on Board a good Azimuth Compaſs) but I always found that the beſt Obſervations we could make, when compared together, differed ſo much, that we could not depend upon them, to much leſs than 3 or 4 Degrees, or ſometimes half a Point of the Compaſs.

The End of the Seventh Volume.

ERRATA in Vol. VII. Part iii.

PAGE 595, *in the Margin, add* No. 371. p. 20. p. 733. line 30. *for* Carthaticum *read* Catharticum. pag. 735. line 31. *dele* to. line 32. *read* to be ſeparated.

PART IV.

Page 43. *for* Chap. II. *read* Chap. III. p. 96. *for* i. 1. *read* 5.

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Fig. 15

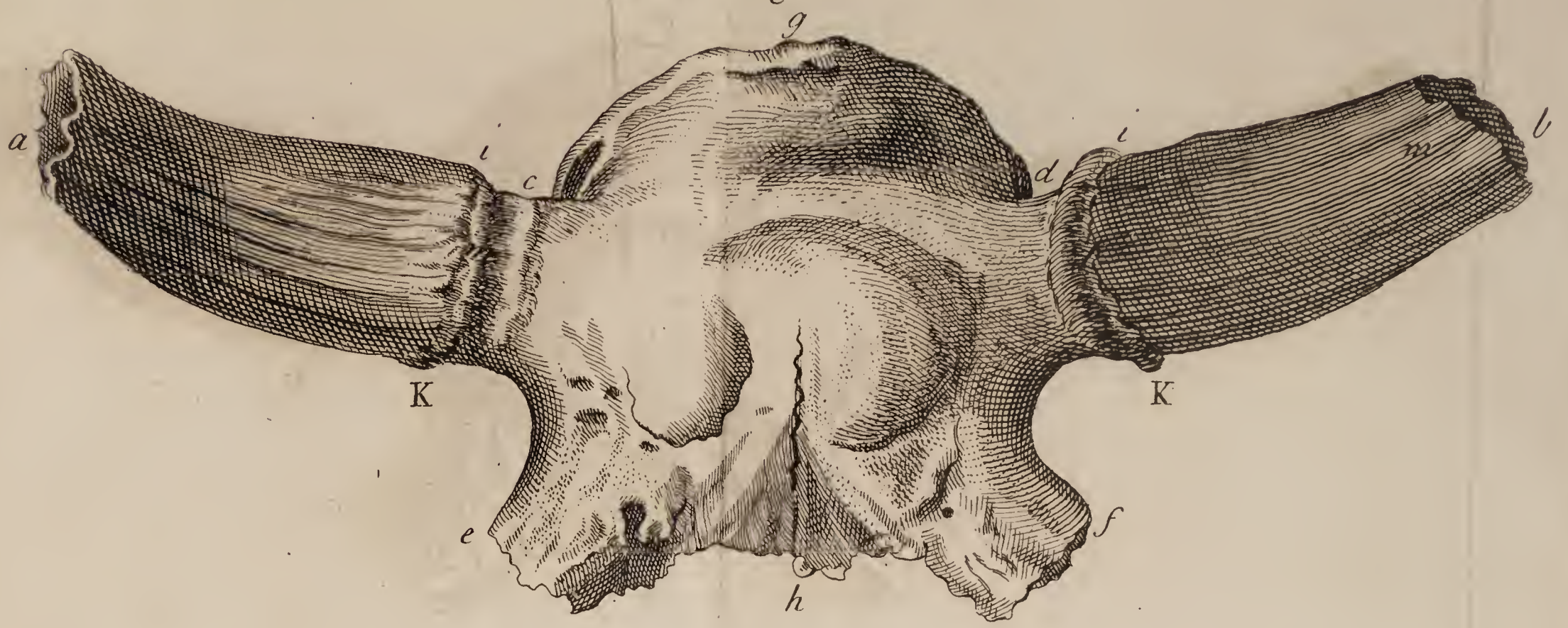

Fig. 16

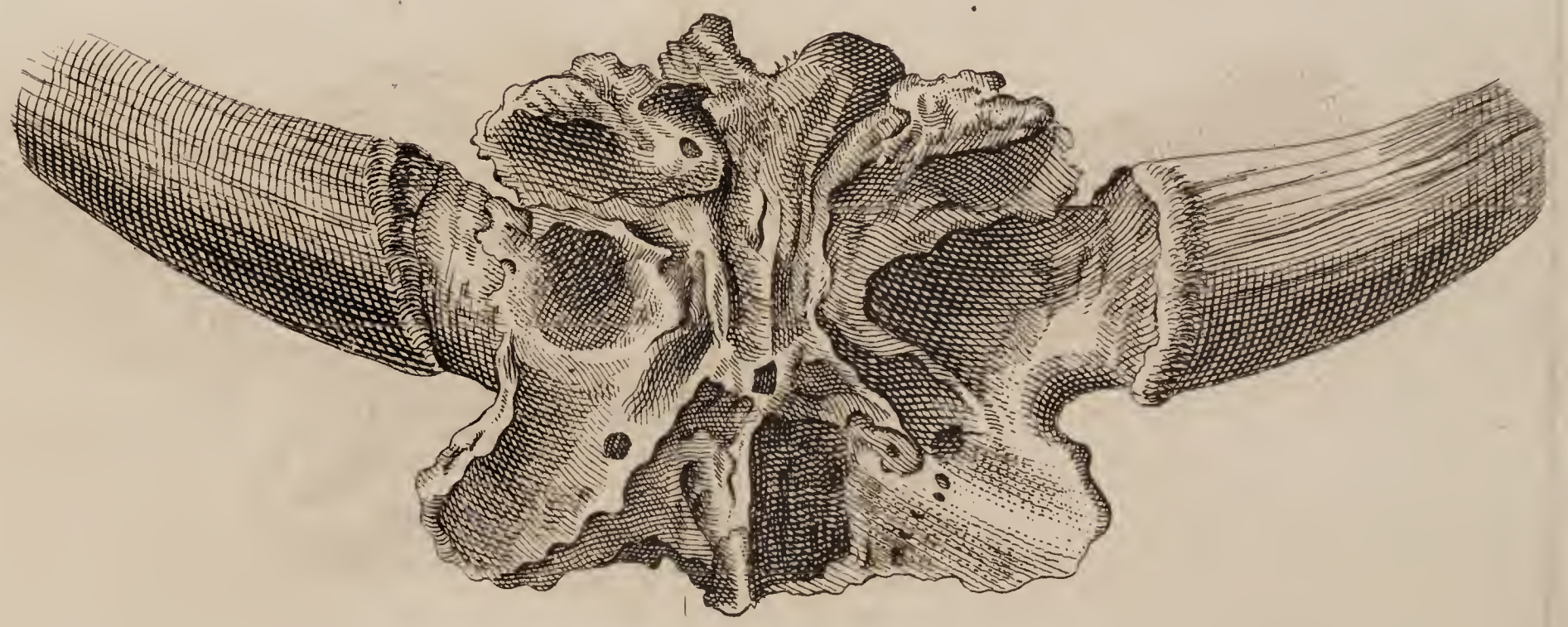

Fig. 17

Tomo sculp.

A GENERAL INDEX OF ALL THE MATTERS contained in the Seven VOLUMES.

NOTE, *That the* Numeral Letters *denote the* Volume; ii *ſignifies the* Second Part (*in the* IVth *and* Vth *Volumes*) i, ii, iii, iv, *ſignify the Parts in the* VIth *and* VIIth *Volumes, and the* Figures *ſignify the* Page.

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